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DISEASES CAUSED BY BACTERIA AND FUNGI.

WILLIAMS, W. L. (1937). **The Identification of Streptococcus of Mastitis in Routine Milk Samples.**—*Amer. J. publ. Hlth.* **27.** 453.

441 bacterial strains from 630 routine samples were isolated by incubation and plating on blood agar. 52% were classified as *Str. agalactiae* and 34% as *Str. lactis*. *Str. pyogenes* was isolated on one occasion only.

140 of the 228 strains of *Str. agalactiae* were obtained from milk samples in which the cell count was over 500,000 per c.c. and in which streptococci were seen microscopically in direct milk samples. 60 were from samples showing streptococci microscopically but having a cell count of under 500,000 per c.c., whilst 28 were from samples in which the cell counts were high but no streptococci were seen on microscopic examination.—H. E. BYWATER.

I & II. SCHMIDT, H. (1936). Beiträge zur Kenntnis der hämolytischen Streptokokken und der Eigenschaften des Antistreptokokkenserums. I. Die Fibrinolyse der Streptokokken. II. Die Hemmung der Fibrinolyse durch Antistreptokokkenserum. [**Haemolytic Streptococci and Properties of Antiserum. I. Fibrinolysis. II. Inhibition of Fibrinolysis by Antiserum**].—*Z. ImmunForsch.* **87.** 1-8 and 9-16. 5 tables. [4 refs.]

III. SCHLÜTER, W., & SCHMIDT, H. (1936). Beiträge zur Kenntnis der hämolytischen Streptokokken und der Eigenschaften des Antistreptokokkenserum. III. Das Streptokokkenhämotoxin. [**Haemolytic Streptococci and Properties of Antiserum. III. Haemotoxin**].—*Ibid.* 17-28. 2 tables. [10 refs.]

IV & V. SCHMIDT, H., (1936). Beiträge zur Kenntnis der hämolytischen Streptokokken und der Eigenschaften des antistreptokokkenserums. IV. Ueber die Artspezifität der Streptokokkenfibrinolyse. V. Antigene Eigenschaften des Streptokokkenfibrinolysins. [**Haemolytic Streptococci and Properties of Antiserum. IV. Specificity of Fibrinolysis. V. Antigenic Properties of Fibrinolysins**].—*Ibid.* 177-184 and 268-279. 10 tables. [11 refs.]

I. The property of haemolytic streptococci of human origin to lyse human fibrin reported by TILLET and GARNER [see *V. B.* **6.** 633.] is present in nearly all strains but to a markedly variable degree. It is present in the centrifuged

culture medium. Occasionally haemolytic strains from animal sources have this property. They act less well on equine or bovine fibrin. Only exceptionally can human strains lyse animal fibrin.

II. It is shown that active anti-streptococcus sera prepared in horses have, like the serum of patients recovered from streptococcus infections, anti-fibrinolytic properties. These can be evaluated and expressed numerically.

III. The haemotoxin described by WELD [see *V. B.* **4.** 597.] can be prepared in sera from various species but not in other fluids. It appears that other fluids may extract the toxin but cannot conserve it. Increasing dilution of the serum results in the extraction of less and less toxin. Heating of the serum does not interfere with subsequent extraction. It is best conserved at pH 8·0 without preservative. The same streptococci can be extracted five times. The toxin kills white mice by causing haemolysis of the erythrocytes and in large doses has similar effects on rabbits. It causes necrosis when inoculated subcut. into g.pigs. The potency of the haemotoxin that can be produced runs parallel with the haemolytic power of culture filtrates but not with the " infectiousness " of the strain. The haemotoxin and haemolysin from culture filtrate is not necessarily the same.

IV. Fibrin can be prepared from plasma or fibrinogen solution for one species by the addition of thrombin from other species. Whilst certain streptococci of human origin can lyse fibrin of animal origin and streptococci of animal origin sometimes lyse human fibrin, far larger amounts of fibrinolysin are required than are necessary for the lysis of the homologous fibrin. Animal streptococci as a rule, moreover, are less active even on fibrin of the same species. In the case of fibrinogen solution the source of the thrombin may affect the results, the best results usually being obtained with homologous thrombin. Pathogenic streptococci can usually lyse the fibrin of the affected species.

V. The fibrinolytic agent can be preserved in the dry state. It is best made from broth without serum. It is antigenic. The anti-fibrinolysin cannot be absorbed by the streptococci but is neutralized by fibrinolysin.

—A. W. STABLEFORTH.

CHAPMAN, G. H., LIEB, C. W., BERENS, C., & CURCIO, Lillian. (1937). **The Isolation of Probable Pathogenic Staphylococci.**—*J. Bact.* **33.** 533-543. 4 tables. [3 refs.]

Bearing in mind the difficulty of selecting probable pathogenic staphylococci from mixed samples on plates, a search was made for a selective medium.

The correlation between *in vitro* tests (haemolysis, ability to coagulate oxalated human plasma, and the appearance on crystal violet agar) and pathogenicity was considered sufficient to use the former as an indication of whether the strains were pathogenic.

The majority of such strains grew on proteose lactose agar containing brom-thymol blue to a concentration of 0·17 g. per litre, the pH having been adjusted to 9·6 with a hydrogen electrode before sterilization. This concentration of brom-thymol blue inhibited the growth of non-pathogenic staphylococci.—D. L. H.

JULIANELLE, L. A. (1937). **Determination of Staphylococcal Types by Fermentation of Mannite.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 117-119. 1 table. [5 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 596. Signed G. S. WILSON].

The separation of staphylococci into immunological types on the basis of their chemically distinct carbohydrates can be accomplished by the use of specific precipitating antisera. It is now shown that a much simpler method is to make

use of mannitol fermentation. Thus, of 62 pathogenic strains belonging to Type A, 60 produced acid from mannitol within five days, while of 40 non-pathogenic strains belonging to Type B, only 3 fermented this substance. It may be noted that (1) the distinction between pathogenic and non-pathogenic strains was based purely on their source of origin, not on their virulence to animals, and (2) all except 6 of the pathogenic strains were of the *aureus*, and all the non-pathogenic strains were of the *albus* type.

PERAGALLO, I. (1937). Sulla possibile identificazione di eventuali tipi immunologici dello stafilococco. [**The Identification of Antigenic Types of Staphylococci**].—*G. Batt. Immun.* **18.** 577-589. 2 tables. [7 refs.] [English, French and German summaries]. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 596. Signed G. S. WILSON].

Staphylococci were grown on nutrient agar for 24 hours at 37°C., and treated by trichloracetic acid in a way that was essentially similar to Boivin and Mesrobeanu's modification of Avery and Goebel's technique. Twenty strains of staphylococci of various origin were used. An amorphous white powder was extracted, which dissolved readily in water and gave a clear solution in 1 per cent. concentration. It did not respond to the usual protein tests, but gave a positive Molisch reaction in high dilution. Precipitation occurred with antistaphylococcal sera, 3 of the 20 strains falling into one group, referred to as Group A, and the remainder into another group, referred to as Group B. Examination of the strains showed that those belonging to Group A were fatal to rabbits on intravenous inoculation and stimulated the production of antitoxin when inoculated in suitable doses, while those belonging to Group B were non-virulent and failed to stimulate the production of antitoxin. The carbohydrate substances themselves were non-antigenic.

KNIGHT, B. C. J. G. (1937). **The Nutrition of** *Staphylococcus aureus*; **Nicotinic Acid and Vitamin B_1.**—*Biochem. J.* **31.** 731-737. 1 table. [16 refs.]

Until the present work *Staphylococcus aureus* had not been grown on a medium the chemical composition of which was completely known. K. had grown this organism previously on acid-hydrolysed gelatin and glucose with autolysed yeast extract (marmite), and in a collection of amino-acids, glucose and the extract.

It was found that autolysed yeast extract contained two growth factors, and that these two factors could be replaced by nicotinic acid and vitamin B_1 acting together.

K. thus has succeeded in growing *S. aureus* in a medium containing only known chemical constituents.—D. L. HUGHES.

JEZIĆ, J., & KODRNJA, E. (1936). Eksperimentalno dokazivanje trajnosti imuniteta stečenog jednokratnom bedreničnom vakcinom. [**Immunity after Single Anthrax Vaccination**].—*Jugoslov. vet. Glasn.* **16.** 295-302. 7 tables.

The immunity obtained with the single-dose anthrax vaccine prepared by JEZIĆ at the Experimental Station, Zagreb, was tested in cattle and sheep both in the laboratory and in the field. In over 41,000 vaccinated sheep no case of break of immunity was observed. In 76,000 cattle that had been vaccinated up to the year ending 1935, altogether 25 cases of absence of immunity were recorded. The duration of the immunity was proved to be nearly 12 months for sheep and over 8 months for cattle.—B. OSWALD (SKOPLJE).

JANUSCHKE, E. (1936). Beiträge zur Kenntnis der Pathogenität und Biologie des Milzbrandbazillus. 4. Teil. Formwechselerscheinungen beim Milzbrandbazillus. [**Pathogenicity and Biology of *B. anthracis*. 4. Mutation**].—*Prag. tierärztl. Arch.* **16.** 175-200. 29 figs. on 4 plates, 2 tables. [Numerous refs.] [See also *V. B.* **7.** 49].

An interesting bacteriological study of the morphological variation which *B. anthracis* may undergo during cultivation. Those interested are referred to the original. Colony formation varied from tiny pin-head colonies like streptococcal colonies, through a series of grades including the classical colony to a continuous smeary growth resulting from swarming. Matt and glossy surfaces were seen. The microscopic appearance of colonies also showed marked variation. Striking morphological variations of the organisms themselves were seen. These included typical square-ended bacilli, club forms, irregular masses and granular forms. Gram-positive and Gram-negative varieties were also reported. An attempt was made to correlate colony-form and pathogenicity.—E. J. PULLINGER.

I. IVÁNOVICS, G. (1937). Das Vorkommen der spezifischen Kapselsubstanz der Milzbrandbazillen in verschiedenen aeroben, sporentragenden Saprophytenbazillen. [**Specific Capsule Substance of Anthrax Bacilli in Various Aerobic, Spore-Bearing Saprophytic Bacilli**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 211-220. 4 figs., 3 tables. [14 refs.]

II. IVÁNOVICS, G. (1937). Unter welchen Bedingungen werden bei der Nährbodenzüchtung der Milzbrandbazillen Kapseln gebildet? [**Cultural Conditions influencing Capsule Formation by *B. anthracis***].—*Ibid.* 449-455. 2 figs., 1 table. [10 refs.]

III. DE ANGELIS, E. (1937). **A Reaction with Iron Compounds for the Determination of B. anthracis and of its Pathogenicity.**—*J. Bact.* **33.** 197-206. 2 tables. [6 refs.]

I. Filtrates from broth cultures of capsulated and non-capsulated strains of anthrax bacilli and also from one strain of capsulated saprophytic bacillus gave definite precipitin reactions with anti-anthrax serum. [Since the precipitin test was not carried out according to the "optimal ratio" method, titres cannot be compared with accuracy]. Filtrate of *B. anthracis* gave no precipitin reaction with "anti-saprophyte" serum. It is considered that the cross-precipitation resulted from the production of similar capsular material by the anthrax and one saprophytic strain. Production of capsular substance *in vitro* was greatest in potato medium.

II. Capsule production by *B. anthracis* is more effective under cultural conditions if grown in an atmosphere containing 10% to 25% of CO_2 rather than in normal atmospheric air. A CO_2 tension of this order does not influence the virulence of *B. anthracis*.

III. The following method is given for differentiating *B. anthracis* from non-pathogenic members of the same genus. The unknown culture is seeded on to a Bacto-North gelatin agar slope which is incubated for 8 to 9 hours till a strong growth has commenced. Then 0·5 c.c. of 10% ferric chloride solution is carefully delivered into the tube at the bottom of the slope. The tube is then reincubated in the upright position. If the culture is *B. anthracis* an intensely red zone of colour appears at the top of the slope during the next 18 to 24 hours, whilst saprophytic forms give no such red colour.

In cases of doubt an indirect confirmatory test should be applied. It has been found that if *B. anthracis* and a saprophytic form are inoculated on to the agar together as a mixed culture there is no production of red colour. The indirect test is carried out as follows :– a known culture of *B. anthracis* and the unknown

one to be tested are inoculated as a mixture. If the red colour is produced the unknown culture must have been *B. anthracis*; if there is no red colour it was a saprophyte.—E. J. PULLINGER.

I. DEVINK, L. P. H. J. (1936). Recherches sur l'existence d'une tuberculose congénitale expérimentale chez le cobaye. [**Congenital Tuberculosis in G. Pigs**].—*C. R. Soc. Biol. Paris.* **123.** 373-375. [1 ref.]

II. GOYAL, R. K. (1936). Elimination précoce des bacilles tuberculeux par des voies diverses chez le lapin et le cobaye. [**Routes of Excretion of Tubercle Bacilli in Rabbits and G. Pigs**].—*Ibid.* 379-383. 2 tables. [7 refs.]

III. PEZZANGORA, F. (1936). La dispersion du bacille de Koch administré *per os* et la diffusion de l'infection tuberculeuse d'origine digestive. [**Routes of Dispersion of Tubercle Bacilli Administered** *per os*].—*Ibid.* 476-478. 2 tables.

IV. MIYAMOTO, Y., & SHIMAZAKI, T. (1936). **On the Pathogenicity of Several Strains of Tubercle Bacilli for the Rabbit when Inoculated Separately or Jointly into the Anterior Chamber of the Eye.**—*J. Jap. Soc. vet. Sci.* **15.** 165-173 of pt. 1. 7 figs., 1 table. [5 refs.] [In Japanese: abst. from English summary pp. 31-32 of pt. 2].

V. MEDLAR, E. M., & SASANO, K. T. (1936). **The Interplay of the Cells of the Hematopoietic Tissues in Rabbits Infected experimentally with the Tubercle Bacillus. The Origin of the Monocyte Considered.**—*Amer. J. Path.* **12.** 825-854. 36 figs. on 13 plates, 6 tables, 1 chart. [11 refs.]

VI. ZEYLAND, J., & PIASECKA-ZEYLAND, E. (1936). **Vitamin D in the Experimental Tuberculosis of Guinea-Pigs.**—*Tubercle, Lond.* **17.** 198-202. [18 refs.]

I. deV. examined 87 young g. pigs, seven of second gestation, from female g. pigs inoculated with mammalian strains of tubercle bacilli. All were killed when 4 months old, their organs being cultured on Löwenstein's medium and examined histologically. Some of the lungs of the young g. pigs showed well defined foci suggestive of a tuberculous process and containing intracellular acid-fast granules. Although the placentas of 7 were infected all the young g. pigs were healthy.

A bacillus with avian characteristics of the Yersin type was isolated from the placenta of a g. pig injected with a human strain of tubercle bacillus. The author admits that this finding may have been due to natural infection.

II. Rabbits were inoculated with various mammalian and avian strains of tubercle bacilli and g. pigs were given the same strains and also certain special strains of mycobacteria.

All animals were bled out previous to examination at varying intervals after inoculation and blood cultures were sown on Löwenstein's medium. Serial washings of the tracheal mucous membrane and samples of bile were collected aseptically for culture on Löwenstein's medium and for g. pig inoculation. In the case of the g. pigs urine samples were also dealt with.

The principal route of excretion for rabbits was the trachea (after 48 hours) and in the case of the g. pigs the organisms were also in the bile. Blood culture gave irregular results and was not influenced by the virulence of the bacteria used. Only one of the 27 urine samples from the g. pigs was positive.

III. P. examined the duodenal mucous membrane, washings of the duodenum and the mesenteric and ileo-caecal lymph nodes of g. pigs, after giving a feebly pathogenic bovine strain of tubercle bacilli *per os*, at intervals of 1, 4, 8 and 10 days, and similarly the lungs, spleen, mesenteric plus cervical lymph nodes, duodenal mucous membrane and the mesentery plus mesenteric lymph nodes 10, 20, 30 and 40 days after giving a virulent bovine strain of tubercle bacilli.

Neither culture nor inoculation tests revealed bacilli in the duodenum after the tenth day. The lungs and spleen were not invaded for several days after the involvement of the alimentary lymph nodes. No macroscopic lesions in the walls of the digestive tract were found *post mortem*.

IV. The authors have previously reported that the pathogenicity of strains of tubercle bacilli of varying virulence is higher after they are injected together into the anterior chamber of the rabbit's eye than when any single strain is used.

They have now tested in a similar manner the pathogenicity of the following combinations of tubercle bacilli; BCG alone, a virulent human strain of tubercle bacilli and two mixtures of these bacilli. BCG alone was least pathogenic and both mixtures were considerably more pathogenic than either of the doses of the human strain of tubercle bacillus used.

They conclude that BCG when injected in conjunction with a virulent strain of tubercle bacillus enhances pathogenicity.

V. The authors studied the changes and interplay of the different cell types in the various haematopoietic tissues during the evolution of acute tuberculosis in rabbits over a five year period. They emphasize that these tissues are essentially mobile.

They found that undifferentiated cells, perhaps stem cells, enter the circulation and retain their ability to multiply in the blood and probably in other than blood-forming tissues. Monocytes appeared to originate from certain lymphoid tissues besides the spleen (not from the reticulo-endothelial system apart from its lymphoid portion, nor from the marrow).

M. and S. show the importance of considering all the haematopoietic tissues in pathological processes. They consider that observations on individual parts of the R.E.S. are misleading.

VI. The authors describe numerous tests of vitamin D, since its discovery in the form of irradiated ergosterol, for the treatment of tuberculosis.

They describe their own tests on tuberculous g. pigs in doses corresponding to those tried in human therapy. Half the animals in two groups of 20 guinea pigs received respectively 25 international units of vitamin D on alternate days and 750 units of vitamin D daily, the remainder acting as controls. There was an insignificant prolongation of life in each treated group, but no influence on the course of the disease could be determined.—C. V. WATKINS.

WITTE, J. (1937). Weitere Beiträge zur Züchtung der Tuberkelbakterien unter besonderer Berücksichtigung der Diagnose. [**Diagnosis of Tuberculosis by Cultural Methods**].—*Z. InfektKr. Haustiere.* **50.** 237-250. 6 figs., 2 tables. [5 refs.]

It is emphasized that the medium used for primary isolation of tubercle bacilli should never contain glycerin, since the rate of growth on glycerin-containing medium becomes a vital factor if the organism isolated is to be ultimately typed. Petragnani's medium is suitable for primary isolation of tubercle bacilli, but it can be further enriched by the addition of broth and potato or pea flour. "Casein-digest" is a better source of amino-acid than Witte peptone. It is desirable to seal culture vessels to obtain that gas tension which ensures good growth, but still better growth may be obtained if the tubercle bacilli are grown in symbiosis with *Bacillus simplex* [a Gram-positive sporulating aerobe which grows on solid medium as a circumscribed, non-spreading colony]. This organism produced conditions so suitable for the growth of bovine tubercle bacilli that copious, easily recognizable growth was obtained on first isolation within 10-20 days incubation.—E. J. P.

INNES, J. R. M. (1937). **The Lesions Produced in the Organs of the Rabbit by Single and Repeated Intravenous Injections of BCG : A Preliminary Note.** —*Proc. R. Soc. Med.* **30.** 887-890. [15 refs.]

A series of 90 rabbits was inoculated intravenously with BCG by single or repeated doses ranging from 0·005 to 10 mg. The animals were killed at intervals varying from 24 hours to 290 days after the primary dose and their organs were subjected to histological examinations.

The main changes occurred in the lungs. The sequence of events is described, commencing with a polynuclear invasion and passing through the stages of proliferation of fixed mesenchyme cells, appearance of monocytes and finally the formation of a mature tubercle usually without necrosis. Some of the lesions persisted for a long period (205 days), but the majority retrogressed at a comparatively early stage. No fibrosis was seen in sections stained by ordinary methods, but a well-marked argyrophile fibrillary network was revealed by a silver impregnation method.

The reactions in reinoculated rabbits were sometimes severe with acute respiratory distress followed by death in from 24 hours to 7 days. In such animals the lungs were completely consolidated and showed an intense exudation. In other cases the reactions were less marked : in these instances the pulmonary changes were similar to those resulting from the initial dose. The comparatively rapid disappearance of the inoculated organisms from the lungs is also discussed [similar results have been obtained in calves—see *V. B.* **5.** 685].—R. E. GLOVER.

BERTRAND, I., BABLET, J., & BLOCH, F. (1937). Sur la détermination du type originel des souches de bacilles tuberculeux par l'inoculation intracérébrale expérimentale. [**Typing of** *Myco. tuberculosis* **Strains by Intracerebral Inoculation of Rabbits**].—*C. R. Soc. Biol. Paris.* **124.** 108-111. [3 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 599. Signed S. R. GLOYNE].

The authors have inoculated rabbits intracerebrally with a suspension of 1/20th of a mgm. of tubercle bacilli of various strains, and regard the method as useful for the rapid determination of the type of bacillus under investigation. The avian strain produced an early general infection, and death within 15-20 days with extensive local lesions and containing enormous numbers of bacilli. The bovine strain produced lesions much the same, but death was delayed – 15-30 days (after a week or two of paralysis). In the case of the human strain, on the other hand, the rabbit quickly recovered from the inoculation, put on weight for some weeks and did not present paralysis. The local lesions tend to regress and even to calcify.

VALTIS, J., & VAN DEINSE, F. (1937). Perte de virulence d'une culture de bacilles tuberculeux de type bovin à caractère dysgonique. [**Loss of Virulence of a Dysgonic Culture of Bovine Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **124.** 22-23. [3 refs.]

The authors report the complete loss of virulence of a dysgonic strain of bovine tubercle bacillus as a result of incubation on Besredka's medium without subculture for one year. When ultimately subcultured the strain, though no longer virulent, had retained its dysgonic character.—E. J. PULLINGER.

SAENZ, A. (1937). Perte de virulence et stabilité de la variété R d'une souche de bacilles aviaires observées après cinq années de passages *in vitro* sur pomme de terre glycérinée. [**Loss of Virulence and Stability of an Avian Tubercle Bacillus Observed after Five Years of Cultivation on Glycerinated Potato**]. —*C. R. Soc. Biol. Paris.* **124.** 704-706. [3 refs.]

Subculture of a rough variant of a smooth strain of avian tubercle bacillus for several years on glycerin potato resulted in complete loss of virulence and the stabilization of an irreversible " R " variant.—E. J. PULLINGER.

VALLI, M. (1937). Confronto fra il valore del terreno di Petragnani e quello di altri terreni per l'isolamento del bacillo tubercolare. [**Comparison of Media for Isolation of** *Mycobacterium tuberculosis*].—*Ann. Igiene (sper.).* **47.** 169-179. [10 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 599. Signed H. H. S.]

Five media are compared, *viz.*, those of :– Sweany-Evanoff-Gross ; Corper-Uyei ; Herrold ; Guernon ; and Petragnani. The method of preparation of each is described and cultivation was attempted with sputum treated with 3 or 4 per cent. NaOH for the first, fourth and fifth ; with 6 per cent. H_2SO_4 for the second, and 10 per cent. of the acid for the third. After seeding, the cultures were kept at 37°C. and observed every five days. Growth appeared earliest on Guernon's medium (twice by tenth day, Petragnani's and Sweany's each gave one positive by that date), the others showed none till the fifteenth day. By this day Petragnani's gave the best growth, and as it is the most convenient to prepare and work with, it is considered by the author to be the most suitable for cultivation.

WEILAND, P. (1936). Welche Bedeutung ist dem retikuloendothelialen System bei der aktiven Immunisierung gegen Tuberkulose zuzumessen ? [**Role of the Reticulo-Endothelial System in Active Immunity to Tuberculosis**].—*Z. ImmunForsch.* **88.** 460-471.

G. pigs were infected by subcut. injections of a strain of tubercle bacillus of low virulence and, as was expected, such animals subsequently showed increased resistance even to intracardially administered injection of virulent tubercle bacilli. Blockade of the reticulo-endothelial system in animals treated with the avirulent strain had no influence upon the development of this type of immunity. Nor had such blockade any influence upon the rate of development of tubercle infection in susceptible g. pigs. Saprophytic acid-fast bacteria were also inoculated into g. pigs (some with blockaded and others with unblockaded reticulo-endothelial systems), and colony counts were subsequently made of organisms surviving in the various tissues. It was found there was a similar degree of survival in blockaded and unblockaded animals.—E. J. PULLINGER.

RUYS, Charlotte A. (1937). Fréquence de la tuberculose du type bovine chez l'homme dans les pays-bas. [**Bovine Type Tuberculosis in Man in Holland**]. —*Bull. Off. int. Hyg. publ.* **29.** 342-347.

R. examined 115 sputum samples from tuberculous patients in Amsterdam and found bovine type strains in 3, against 10 out of 89 samples from country dwellers. The bovine type was also present in 16 out of 188 tuberculous children. It is stated that some 35% of all cattle slaughtered in Amsterdam in 1933 and 1934 were tuberculous and that 40% of 11,000 cattle in the province of north Holland reacted to the tuberculin test.—J. E.

I. RINJARD, P., & VALLÉE, M. (1936). Paratuberculination et maladie de Johne. [**Reliability of Johnin as a Diagnostic Agent**].—*Rev. gén. Méd. vét.* **45.** 705-712. 1 table. [Numerous refs.]

II. LANG. (1937). Die Paratuberkulose des Rindes und Versuche über die Ermittlung infizierter Tiere mittels diagnostischer Verfahren. [**Diagnosis of Johne's Disease**].—*Münch. tierärztl. Wschr.* **88.** 1-4, 14-18 and 27-32. 10 tables.

I. Johnin should contain a minimum of extraneous matter apart from the essential extract of acid-fast bacilli. Consequently it should be prepared by growing freshly isolated cultures on synthetic medium such as Sauton's. Filtration of the extract should be replaced by ultracentrifugation.

Experience has shown that double intradermal inoculation is the best method of testing with johnin. Infected animals usually show a thickening of the skin-fold to double the original thickness or more, but since such large swellings are not always present the nature of the swelling should also be noted. When good johnin is used healthy animals only show very slight swellings (3-4 mm. increase of skin-fold). When judging the value of johnin in field experiments the crucial diagnosis of infection must be based upon detailed *post-mortem* and bacteriological examinations.

II. An account of the practical application of the specific tests. The conjunctival, intradermal and subcutaneous tests were used simultaneously, avian tuberculin being the reagent employed, in a heavily infected herd in which 48% of 180 tested animals gave positive reactions to at least one of the tests. Diagnosis was checked by *post-mortem* examination but it is not clear whether such examination included attempts at cultivation of the organism. There was very little agreement between the results of the johnin testing and the *post-mortem* findings. [It seems probable that only very obvious advanced cases were recognized *post mortem*]. It is concluded that the most effective diagnostic procedure is to combine a double conjunctival test with the subcutaneous and intradermal methods.
—E. J. PULLINGER.

RAJAGOPALAN, V. R. (1937). **Pneumonia in Foals due to** *Corynebacterium equi*. —*Indian J. vet. Sci.* **7.** 38-53. 2 text figs., 9 figs. on 4 plates, 4 tables. [9 refs.]

R. states that heavy losses in foals in breeding districts in India, especially in those up to 12 weeks old, are due to a specific pneumonia caused by *Corynebacterium equi* (Magnusson, 1923). The disease was produced experimentally by intranasal infection and the period of incubation was 6 to 8 days; symptoms included fever, watery discharge from the eyes and nostrils, dry cough and snoring, and in some cases enlarged joints – particularly the hock – followed by pneumonia, diarrhoea, emaciation and death in from 8 to 20 days. *Post-mortem* examination revealed abscesses in the lungs containing fluid or inspissated pus with a characteristic bad odour. The mediastinal lymph nodes were enlarged and contained huge abscesses, and affected joints contained slightly haemorrhagic gelatinous fluid. Histological lesions and cultural and biochemical characters are described. The organism is non-pathogenic for rabbits and g. pigs and practically harmless to adult horses. Attempts at vaccination and treatment with mercurochrome and iodine were inconclusive. The incidence has been reduced by hygienic measures, rotation of grazing grounds, and avoiding stabling of any kind for the first year of life.—E. E. JELBART.

VAN ES, L., & MCGRATH, C. B. (1936). **Swine Erysipelas.**—*Res. Bull. Neb. agric. Exp. Sta.* No. 84. pp. 47. 5 figs. [Numerous refs.]

As swine erysipelas has increased of late in Nebraska, it was thought desirable to publish an up-to-date account for the benefit of veterinarians and others; the bulletin is systematic and detailed, including a section on this infection in man and animals other than swine.—J. E.

I. Hammann, H. (1936). Untersuchungen über die Glatt- und Rauhformen des Bacteriums erysipelatos suis. [**Smooth and Rough Forms of** *Erysipelothrix rhusiopathiae*].—*Inaug. Diss., Vienna.* [Abst. from abst. in *Wien. tierärztl. Wschr.* **23.** 745-746].

II. Vawter, L. R. (1937). **A Culture Medium for Erysipelothrix rhusiopathiae.** —*J. Amer. vet. med. Ass.* **90.** 635-636. [2 refs.]

I. H. deals chiefly with the morphological and biological differences between rough and smooth colonies of *E.r.* paying particular attention to their antigenic properties. Experimental results obtained from 50 strains show that the rough forms follow from the smooth when the relative nutrient value alters. Subcutaneous inoculation experiments with white mice proved the smooth colonies to be slightly more virulent than the rough. No difference in their antigenic properties could be determined following experiments with white mice, in which erysipelas serum, obtained from highly immunized sheep, was used.

II. As a basal medium, V. favours liver-digest solution enriched by the addition of from 2%–4% sterile normal horse serum. He describes the method of preparation. Colonies appear on serum-enriched liver-digest agar after incubation for 24 hours, reaching their maximum size of 0·5 mm. in about 48 hours, and are larger than on other media heretofore recommended. Rough and smooth colonies can be readily distinguished on plate cultures after incubation for 48 hours. Whole culture *E.r.* antigens do not remain sensitive for more than three or four days after preparation and do not spontaneously agglutinate during the incubation period.—M. Burke.

I. Umezeu, M. (1936). **Studies on the Purification of Mallein III. Chemical Analysis of** *Pf. mallei* **and Proteins Obtained from its Culture, as well as its Nitrogen and Carbohydrate Metabolism.**—*J. Jap. Soc. vet. Sci.* **15.** 128-142 of pt. 1. 8 figs., 3 tables. [15 refs.] [In Japanese: abst. from English summary pp. 23-24 of pt. 2].

II. Legroux, R. (1936). Traitement de la morve des équides. [**Treatment of Glanders in Horses**].—*C. R. Acad. Sci., Paris.* **203.** 345-347. [1 ref.]

III. Toyoshina, T., & Shibuya, Y. (1937). **Cultivation of** *Pfeifferella mallei.* —*J. Jap. Soc. vet. Sci.* **16.** 136-153 of pt. 1. 2 figs., 9 tables. [3 refs.] [In Japanese: abst. from English summary pp. 19-20 of pt. 2].

I. Cultures of *Pf. mallei* were chemically analysed and shown to contain about 10% total solids, of which 7-8% are ether-soluble substances and about 80% crude protein. The pure protein content varies with the culture media. The nitrogen distribution of the proteins was examined. *Pf.m.* synthesizes proteins and the combined sugars, splits glucose, during cultivation produces volatile nitrogen compounds, and, when cultivated on glucose peptone water, does not so readily form acids as does *Pf. whitmori.*

II. L. treated 12 clinically affected horses, and 100 which had merely reacted to mallein, with " anamorve " (autolysed cultures of *Pf. mallei,* detoxicated with formaldehyde and heat). All the former were apparently cured within six weeks. The treatment lasted for 30 days, and consisted of three subcutaneous injections of 1 c.c., 3 c.c., and 5 c.c. respectively, at 48-hour intervals, with a period of eight days between each series. In healthy horses, there was no reaction, but in glandered ones, both the local and general reactions resembled that produced by mallein, but were more pronounced. A focal reaction may arise, but new lesions produced, as well as those already present, healed within eight days.

III. T. and S. claim that *Pf.m.* can easily be isolated from contaminated material by cultivation on the following media:– agar medium (pH 6·0), 100 c.c.;

glycerin, 4 c.c. ; glucose, 1 g. Mix and sterilize. Add, before using, 1% thionine in 50% alcohol, 2·5 c.c. It decolorizes thionine distinctly, grows luxuriantly, and forms characteristic greyish-yellow glistening colonies. The growth of many bacteria, especially glucose splitting ones, is inhibited.—G. Williamson.

Černjak. (1936). O chode borby s sapom. [**Glanders Control in the U.S.S.R.**] —*Sovyet. Vet.* No. 8. pp. 84-85.

By a government order of June, 1935, all horses in certain districts were examined for glanders.

Clinical cases were killed and reactors to mallein were isolated. During the first year the percentage of reactors in the Azov-Black Sea area fell from 0·5% to 0·16%, that in the North Caucasus from 2·8% to 0·2% and that in Western Siberia from 1% to 0·3%.

Anon. (1936). Vaccinatie tegen septichaemia epizootica in een gedeelte van de onderafdeeling Makale-Rantepao, afdeeling Loewoe, gewest Celebes en onderhoorigheden, in het tweede halfjaar 1935 (6e halfjaarlijksche vaccinatie). [**Vaccination against Haemorrhagic Septicaemia in Makale-Rantepao, West Celebes, July-December, 1935**].—*Ned.-ind. Bl. Diergeneesk.* **48.** 296-303. 1 table.

The results of the half-yearly prophylactic vaccination against H.S. were again very successful, inasmuch as not a single buffalo contracted the disease within the observation period of six months, whereas several cases occurred among the non-vaccinated animals in the same district.—M. J. J. Houthuis (Rotterdam).

Henning, M. W., & Brown, M. H. V. (1936). **Pasteurellosis : An Outbreak amongst Sheep.**—*Onderstepoort J. vet. Sci.* **7.** 113-131. 4 tables. [12 refs.]

A virulent form of pasteurellosis in Ryeland sheep at the experimental farm of the University of Pretoria is described. The disease was confined to Ryeland sheep ; merino sheep that came in intimate contact with the affected animals remained free from disease. Deaths were recorded in rams only.

Pasteurella were isolated from affected lungs of all the cases studied, a fairly rapid growth being obtained in ordinary broth and on serum agar. The organisms were highly pathogenic for g. pigs and sheep, while rabbits and pigeons withstood very large doses of culture. The lesions produced in sheep resembled those observed in the natural cases and the organisms apparently had a predilection for pulmonary tissue and serous membrane.

The morphological, cultural and biochemical characters of the organism were typical of pathogenic pasteurella of domestic animals.

Agglutinins could not be demonstrated in the sera of g. pigs and rabbits repeatedly inoculated with formolized cultures, and the susceptibility of the inoculated g. pigs was not appreciably reduced after the inoculations.

In addition to the highly virulent pasteurella obtained from the lungs of the natural cases of the disease under investigation, avirulent forms of pasteurella were also obtained from the same animals. Biochemically the latter differed entirely from the former, occurring in much smaller colonies and giving a much poorer growth on laboratory media.

It is recommended that, on investigating an outbreak of pasteurellosis, several colonies of different sizes be studied separately for virulence and for cultural and biochemical characters.

RAYBAUD, A. (1937). Le rôle du chat dans la transmission de la peste. [**The Role of the Cat in Plague**].—*Marseille méd.* **73.** 713-718. [1 ref.] [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 789. Signed W. F. H.]

The cat may be used effectively as a check upon the increase of rats but this is not to be regarded as a very efficient antiplague measure. Indeed the cat itself may develop and transmit plague. A number of the examples are given where this has taken place. It is pointed out that *Ctenocephalus felis* will " bite man as well as *Xenopsylla cheopis* and better than *Ceratophyllus fasciatus*." The cat flea is a carrier of plague.

RIEDEL. (1936). Ein Ueberblick über die neuen Forschungsergebnisse auf dem Gebiet der Paratyphus-diagnostik. [**Progress in Diagnosis of Paratyphoid Infections**].—*Tierärztl. Rdsch.* **42.** 900-907 and 920-922. 1 fig., 2 tables.

The early history of the isolation of strains of the salmonella group associated with food poisoning cases is given, and also a general review of the progress which has been made in methods of identification and differentiation. The work of ANDREWES, BRUCE WHITE and KAUFFMANN on the "H" and "O" antigens and that of LANDSTEINER on the chemical aspect of the latter antigens is considered, followed by the method of classification advocated by KAUFFMANN and MITSUI. This is the basis of the scheme adopted by the Salmonella Subcommittee of the International Society for Microbiology [*V. B.* **5.** 63]. In addition references are made to the use of growing these organisms in various organic acids in a synthetic substrate, for further differentiation.—R. LOVELL.

WRAMBY, G. (1937). Paratyfus hos räv. [**Fox Paratyphoid**].—*Skand. VetTidskr.* **27.** 222-247. 2 tables. [8 refs.] [English summary].

Paratyphoid disease both in silver and blue foxes was recognized in Sweden on many fox farms during June, July and August, 1936. Complete reports of the outbreaks on 22 farms together with bacteriological examinations carried out at the State Veterinary Institute of Bacteriology have enabled the author to give a general review and description of the disease.

Cubs were chiefly affected. The main symptoms were loss of appetite, tottering gait, tense back, tucked-up abdomen, diarrhoea, jaundice and ophthalmia. Usually death followed four to eight days after the onset and the mortality amongst affected animals reached 89%. *Post-mortem* examination revealed an enlarged spleen, enteritis and septicaemia. Icterus was often present.

In the majority of cases the type of organism was found to belong to the Gärtner group (group D) and *Salmonella enteritidis* var. *Dublin*; in three cases it was *S. cholera-suis*. The source of infection was suggested to be previously infected meat or offals, though it is possible that rats as carriers of pathogenic bacteria and perhaps substances used for rat destruction could not be excluded.

Serum treatment proved of little or no value as a curative measure, but specific vaccine treatment seemed to be useful as a general control measure in some instances. Nevertheless prophylactic sanitary measures are recommended as of the greatest importance. [Note: artificial transmission trials by contact as well as by pure culture administration are lacking].—GUSTAV NAERLAND (OSLO).

EDWARDS, P. R. (1937). **The Occurrence of Salmonella, Senftenberg Type, in a Disease of Turkeys.**—*J. Bact.* **33.** 193-195. [4 refs.]

E. examined two cultures, isolated from the livers of turkey poults. He found that they showed the microscopic, cultural and biochemical characters of salmonella, and serological tests showed that they belonged to the Senftenberg type.—W. J. I.

Bezsonova, A., Lenkaja, G., Molodova, P., & Mosolova, O. (1936). **Some Cases of Spontaneous Transmutation of *B. pestis* into *B. pseudotuberculosis rodentium* Pfeiffer.**—*Rev. Microbiol., Saratov.* **15.** pp. 151-162. [Numerous refs.] [English summary]. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 414. Signed W. F. H.]

The close relationship of and the possibility of confusion between *Past. pestis* and *Past. pseudotuberculosis rodentium* have often been described. In this communication the authors maintain that they have observed the transmutation of four human strains of the plague bacillus and one ground-squirrel strain into *Past. pseudotuberculosis rodentium*. The proofs of this transmutation are afforded by means of simultaneous tests of each of the transmuted strains and known control strains as to :- (1) their ability to show growth on agar in 24 hours ; (2) their ability to give any growth at all with sowing of minimal quantities; (3) their fermentation of rhamnose, and (4) the type of the respective growths on various differential media.

I. Emmiel, M. W. (1936). **Pullorum Disease in Captive Quail.**—*J. Amer. vet. med. Ass.* **89.** 716-717. [1 ref.]

II. Hinshaw, W. R., & Hoffman, H. A. (1937). **Pullorum Disease in Ducklings.**—*Poult. Sci.* **16.** 189-193. [11 refs.]

I. Chicks affected were incubator-hatched and were reared from stock that had been placed in captivity. Blood testing was carried out on 10 of the survivors, on 20 of the parent stock, and on 20 birds reared from wild stock, and reactors were found in all three groups. The aggl. reactions obtained were not so distinct as in poultry.

II. Disease occurred in ducklings that were being reared in a pen adjacent to affected chicks. *S. pullorum* was isolated both from chicks and ducklings, but was atypical in its growth characters and in that arabinose was not fermented. The organism was found to be pathogenic for day-old chicks but not for 11-day-old or 36-hour-old ducklings.—W. J. Ironside.

Gliesch, R. (1937). Ueber das septikämische Vorkommen des Bact. alcalescens (Andrewes) bei Kälbern. [*Bact.a.* **Septicaemia in Calves**].—*Tierärztl. Rdsch.* **43.** 5-7. [11 refs.]

Bact.a. is a non-motile, non-lactose-fermenting bacillus probably associated with cases of human dysentery. On one occasion it was isolated from the blood stream of a woman with puerperal fever. A record is given of three " emergency-slaughtered " fortnight-old calves in which this organism was present. In addition to signs of diarrhoea, there was swelling of the liver, spleen and some lymph nodes. In one case the organism was apparently isolated in pure culture from two samples of muscle, two lymph nodes, spleen, liver and kidneys. Identification was based on morphological, growth and biochemical characteristics, associated with a lack of serological reactions with sera prepared from the common types of dysentery bacilli found in man. It is concluded that this organism is in all probability a cause of disease in calves.—R. Lovell.

Tumanskij, V. M., & Kolesnikova, Z. I. (1936). K izučeniju tuljaremii ptic. [**Tularaemia in Birds**].—*Rev. Microbiol., Saratov.* **15.** 231-242. 5 tables. [12 refs.] [German summary].

T. and K. used 2 strains of *Bact. tularensis* of medium virulence to inoculate 17 sparrows, 26 magpies, 19 hooded crows and 11 hens. Some of each species were infected subcut. and the others by infected food. When death occurred it

was sudden. Some of the birds lived as long as 46 days (when they were killed), others died after 1, 2, or 3 days. None of the hens died. Cultures of *Bact. tularensis* were recovered through mice from 10 sparrows, 16 magpies, 12 crows and 4 hens. Affected birds showed insignificant congestive or anaemic changes in the spleen and liver.

Bertrand, G., & Schoenaers, F. (1937). Recherches sur l'origine brucellique éventuelle des kystes ovariens de la vache. [**Possible Connexion between Ovarian Cysts and Brucellosis in Cows**].—*Ann. Méd. vét.* **82.** 15-21. 3 tables.

B. and S. examined 109 bovine ovarian cysts, obtained from an abattoir, for *Br. abortus* and for brucella agglutinins in the cystic fluid. Brucella organisms were not obtained either culturally or by g. pig inoculation, but agglutinins were found in 15 out of 84 cysts examined. They are of the opinion that the agglutinins were of no particular significance, but were derived from the blood. An attempt was also made to produce ovarian cysts in g. pigs by the intra-ovarian inoculation of a suspension of brucella, with negative results.—A. Wilson Taylor.

I. Anon. (1936). Deutsches Reich. Runderlass des Reichs- und Preussischen Ministers des Innern, betr. Bekämpfung des seuchenhaften Verkalbens (Banginfektion des Rindes). [**Germany: Control of Contagious Abortion (Supplementary Orders)**].—*Reichsgesundheitsblatt.* **11.** 922-924. [1 ref.]

II. Haupt, H., & Stockmann, H. (1937). Erfolge hygienischer Massnahmen bei der Bekämpfung des seuchenhaften Verkalbens. [**Hygienic Control of Bovine Brucellosis**].—*Münch. tierärztl. Wschr.* **88.** 85-87.

III. Haupt, H. (1937). Die Aufgabe des Tierarztes beim Kampf gegen die Abortus-brucellose des Rindes. [**Control of Bovine Brucellosis**].—*Ibid.* 73-79.

I. Orders preventing the uncontrolled sale of infected stock, the use of infected bulls for breeding purposes, and the spread of infection to clean herds by human agency. The administrative and financial aspects of routine herd testing are dealt with.

II. Report of the cleaning of two herds from contagious abortion infection in 2-3 years by purely hygienic measures. [None of the cows in either herd showed high agglutinin titres and it seems probable that the infection was already waning from natural causes, or else that the local infection was an extremely mild one].

III. Recapitulation of the principles underlying the control of contagious abortion, including evidence opposing the use of vaccines.—E. J. Pullinger.

Goldstein, J. D., Fox, W. W., & Carpenter, C. M. (1936). **The Recovery of *Brucella abortus* from the Stools of Healthy Carriers.**—*Amer. J. med. Sci.* **191.** 712-715. 1 table. [6 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 633. Signed G. S. Wilson].

Two to four grams of a fresh specimen of stools were suspended in 50 c.c. of saline, and centrifuged at low speed. To the supernatant fluid 0·5 c.c. of an anti-abortus agglutinating serum was added. The tubes were incubated at 37°C. for 2 hours, and centrifuged at low speed for 5 minutes. The sediment was suspended in 2-3 c.c. of saline, and 0·25 c.c. was injected subcutaneously into each groin of a guineapig. The animals were killed 25-35 days later; their blood was examined for agglutinins, and their spleens cultivated in the usual way. Altogether stools were examined from 719 patients, none of whom was suffering from undulant fever, but some of whom contained agglutinins to *Br. abortus* or gave a positive

skin test with abortin. Two positive results were obtained, one from a patient with a titre of 1/60 and one from a patient about whom no data were available. Though it is stated in the title and the conclusions that *Br. abortus* was isolated from the stools, there is no evidence in the text that the exact type of Brucella was ascertained. Control experiments made with *Br. abortus* showed that the method used was able to detect this organism even 150 days after it had been added in small numbers to human faeces, which were subsequently stored at 8°C.

Evans, S. A. (1936). **Some Notes on Brucella Infection in Tanganyika Territory.** —*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 21-25. 2 tables.

A short history of investigation work on brucellosis during 1934 and 1935 is given with some notes on practical observations during the current year. No tangible results were obtained as to the source of human infection under investigation. There is a short discussion on the economics of the disease and it is regarded as having little or no practical significance to the native stockowner, but as causing considerable loss and inconvenience to the commercial dairyman.

The public health aspect is also discussed and its importance stressed.

Malta. (1937). **First Progress Report of the Undulant Fever Committee.** [Polding, J. B.]—*Malta Govt Gaz.* Suppl. No. 42. pp. 541-565. 12 tables, 1 chart, 5 appendixes.

An Undulant Fever Committee was appointed by the Government of Malta in 1935 for the purpose of conducting research into, and of producing a method of, vaccination against *Brucella melitensis* infection in goats. A veterinary pathologist [Polding, J. B.] was appointed in September, 1935. This *interim* report only covers a period of six months of work. Strains of *Br.m.* have been isolated from goats and human beings and are being studied. Tube aggl. testing has been started in connexion with controlling the export of goats from Malta. A start was made with vaccine tests. The course of infection in Maltese goats is being studied.—J. E.

Hayes, F. M. (1937). **Porcine Brucellosis.**—*Vet. Med.* **32.** 112-116. 4 figs.

H. reviews the known facts about this disease. He estimates that 5% of pig herds in America are infected and is of the opinion that, unless proper control measures are instituted, it will shortly reach the economic importance of brucella infection of cattle.

Among symptoms he mentions that sterility may result in gilts. Orchitis and multiple subcutaneous abscesses which occur in boars are illustrated by photographs. Examination of pigs shows that the infection is wide-spread throughout the body, especially in the lymph nodes, following recent infection.

He gives an agglutination titre of 1 : 50 (standardized by Gates' method to a reading of 4 cm.) as doubtful and above 1 : 50 as positive.

For control he recommends segregation of all pigs from cattle, regular monthly aggl. tests of all breeding pigs and segregation of young pigs soon after weaning. If reactors are not reduced by these methods the intervals between tests should be reduced to a fortnight.—C. V. Watkins.

Nohmi, S., Katow, M., & Karasawa, S. (1936). **Abortion of Swine due to *Br. abortus suis*.**—*J. Jap. Soc. vet. Sci.* **15.** 277-285 of pt. 1. 1 table. [Numerous refs.] [In Japanese : abst. from English summary pp. 73-75 of pt. 2].

A sow imported from Great Britain aborted after arrival in Japan. The

authors isolated a bacillus which when grown in appropriate dye media was considered to have the characters of the porcine strain of *Br. abortus*.—R. Fisher.

Ber, A. (1936). **Pathogenicity of *Brucella abortus* for White Mice.**—*J. infect. Dis.* **59.** 285-286. [2 refs.]

A large dose of *Br.a.* causes a bacteraemia in mice almost at once, whereas a small dose remains at the site of inoculation and only gradually appears in the blood. The organisms are slowly removed by the lymph nodes and spleen and finally disappear, but there may be a recurrent septicaemia in a weakened subject. The spleen and lymph nodes are usually enlarged on autopsy. Agglutinins appear about the 15th day and are at the maximum in about 40 days, the highest titre recorded being 1 : 5,120.

B. notes that in white rats large numbers of brucella abscesses occur, especially in the spleen and epididymis.—A. Wilson Taylor.

Beattie, C. P. (1936). **Undulant and Allied Fevers.**—*J. State Med.* **44.** 701-709. 2 charts. [20 refs.]

A discussion of the clinical aspects of U. F. The author considers that the disease is peculiarly rare considering the incidence of bovine brucellosis. Figures of tests for agglutinins in veterinary surgeons are quoted and B. states that in tests of veterinary graduates 58·3% had an aggl. titre of 1 : 20 or over.—J. E.

Evans, Alice C. (1937). **The Distribution of *Brucella melitensis* Variety *melitensis* in the United States.**—*Publ. Hlth Rep., Wash.* **52.** 295-303. 3 tables. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 536. Signed G. S. Wilson].

Hitherto, recognition of infections with *Br. melitensis* has been confined mainly to the goat-raising areas in the South-Western States and in Texas. Examination of 17 human sera from North Carolina and Kansas by a quantitative absorption of agglutinins technique indicated that 7 were derived from patients infected with the *melitensis* type. It is concluded that *melitensis* infection in these areas, where goats are few, must be conveyed by cows : but examination of the milk of these animals has not yet been undertaken.

Binder, L., & Fauszt, E. (1937). Zur Frage der latenten Bang-Infektion. [**Latent Infection with** *Brucella abortus*].—*Klin. Wschr.* **16.** 496-498. [19 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 503. Signed G. S. Wilson].

The author examined the serum of 106 persons for agglutinins to organisms of the Brucella group. (1) Of 17 sera from persons living on farms who had no contact with infected animals, none agglutinated as high as 1/100. (2) Of 67 sera from persons on farms who had no contact with infected animals but who regularly drank their milk, 2 agglutinated to 1/100. (3) Of 22 sera from persons on farms who had been in contact with aborting animals, 7 agglutinated to 1/100 or higher. None of the subjects was suffering, or had apparently suffered, from undulant fever. On the basis of these figures it is concluded that exposure to contact with aborting animals is far more dangerous than drinking their milk. [The justice of this conclusion is very doubtful. Far more information would have to be provided about the degree and length of exposure to risk in each case, and the age and sex of the subjects studied. Moreover, these results concern latent, not overt, infection. There is no reason to believe that healthy persons with a high agglutinin titre are more apt to develop undulant fever than those with a low titre ; indeed there is some evidence to suggest the contrary.]

Weinberg, M., Forgeot, P., & Moureu, A. (1937). Enzootie de gangrène gazeuse à point de départ mammaire, observée chez les brebis en lactation. [**Mammary Gas Gangrene in Ewes**].—*Bull. Acad. vét. Fr.* **10.** 117-122. 1 fig.

An outbreak of mastitis in a flock of ewes suckling lambs is reported, 18 out of 150 being affected, with 12 deaths. The first symptoms noted were loss of appetite and lameness, accompanied by fever. The udder itself was enveloped in an oedematous, firm, non-crepitating swelling extending from the vulva along the abdomen, while the skin was darkened. In fatal cases, the course was three days or more, with a rapid fall in temperature a few hours before death. The *post-mortem* appearance resembled that of enterotoxaemia, with patches of congestion in the small intestine, but no toxin could be demonstrated in the bowel contents. A particularly virulent strain of *Clostridium welchii* was obtained, however, along with a coliform bacillus, from the liver and bone-marrow, and in the exudate from the cut gland. The infection would appear to have gained entrance *via* abrasions on the teats caused by the lamb. The curious feature of the outbreak, and that which hindered clinical diagnosis, was the absence of gas formation, and consequently of crepitation.—A. Wilson Taylor.

Montgomerie, R. F., & Rowlands, W. T. (1937). **"Lamb Dysentery" in a Foal.**—*Vet. Rec.* **49.** 398-399.

A foal died after a short illness in which diarrhoea and abdominal pain were prominent symptoms. On *post-mortem* examination the small intestine was found to be acutely congested and small discrete ulcers were present, resembling the lesions of lamb dysentery.

Organisms recovered from beneath the surface of an ulcer were classified as *Clostridium welchii* Type B.—H. H. Holman.

Weinberg, M., & Guillaumie, M. (1936). Recherches sur les antigènes de l'espèce perfringens. [**The Antigens of** *Clostridium welchii*].—*Rev. Immunol.* **2.** 513-540. 5 tables, 1 chart. [Numerous refs.]

Much of this article is a review of the results of other workers, but results have been obtained and conclusions drawn which tend to upset the usual conception of the *welchii* group. W. and G. found that Type A haemolysin was neutralized equally well by normal sera and by Type D serum, although the latter had a high Type A antitoxic value. The normal sera and Type A serum were also capable of neutralizing Type D haemolysin. They claim that the predominating antigens in Types B and C are not identical, in that Type C toxin has an effect on g. pig muscle that is absent from Type B toxin ; also in that the anti-B and anti-C titres of a horse immunized with *Cl. paludis* varied during the course of immunization. The latter argument is also used in support of the contention that the antigenic structure of Type D (Wilsdon) is not identical with *Cl. ovitoxicum* (Bennets). They conclude that the diagnostic value of the toxin-antitoxin reaction depends upon the use of absolutely specific sera and, while therapeutic sera should contain antibodies against all the toxic products of the organism, their anti-invasive properties are greatly enhanced if they are not only antitoxic but antibacterial. This work is greatly detailed and does not lend itself to abstraction, but should be read in the original by those interested.—A. Wilson Taylor.

I. Walbum, L. E., & Reymann, G. C. (1937). **The Production of Toxin by** *Clostridium oedematiens* (*B. novyi*).—*J. Path. Bact.* **44.** 379-387. 9 tables, 2 charts. [10 refs.]

II. Görtzen, J. (1937). Histologische Veränderungen bei kleinen Versuchstieren nach intravenöser Einführung des Toxins des Fraenkelschen Gasbazillus (B. welchii, B. perfringens). [**Histological Lesions in Small Animals after Intravenous Inoculation with** *Cl. welchii* **Toxin**].—*Zlb. Bakt. I. (Orig.).* **138.** 366-374. [12 refs.]

I. Studies of toxin production under artificial conditions. Toxin remained most stable at about pH 6·0. The best production occurred in 10% peptone veal broth from which all carbohydrate had been removed by fermentation with *Bact. coli.* Similar broth containing the natural carbohydrate was less satisfactory, and 1% glucose broth proved to be the least satisfactory medium. Riedel's peptone (1%) appeared to be a suitable addition for toxin production.

II. Certain histological changes in the tissues of laboratory animals followed intravenous injection of pure toxins of strains of *Cl. welchii.* Rabbits died within a few minutes of injection, g. pigs in 1-78 hours, and white mice in 2-21 hours. G. pigs which survived for 24 hours or more showed a marked red gelatinous oedema of the hypogastrium. There was *ante-mortem* haemolysis in mice which survived at least 6 hours. Apart from the foregoing, animals which died rapidly showed enlargement of the kidneys and sometimes localized pulmonary oedema. The histological findings are detailed. This work confirms the view that the haemotoxin of *Cl. welchii* is not the essential lethal factor.—E. J. Pullinger.

Tanner, F. W., & Oglesby, Elaine W. (1936). **Influence of Temperature on Growth and Toxin Production by** *Clostridium botulinum.—Food Res., Ill.* **1.** 481-494. 3 tables. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 600. Signed G. S. Wilson].

Observations were made on 7 strains of *Cl. botulinum* Type A, 10 strains of Type B, one strain of Type C, and 3 untyped strains. Considerable variation was found between the different strains. In general, however, vegetative cells and spores developed readily in sheep brain medium or in liver broth at 15°C., and produced toxin. At 10°C. growth either did not occur at all or was very slow. Toxin-free spores, *i.e.*, spores heated in boiling water for 15 minutes, required a higher temperature than vegetative cells; even at 15°C. germination rarely occurred. It is concluded that infected foods stored at room temperature may become dangerous fairly rapidly, but when kept at less than 10°C. they are likely to remain safe for a considerable time.

Mason, J. H., & Scheuber, J. R. (1936). **The Production of Immunity to** *Cl. chauvoei.—Onderstepoort J. vet. Sci.* **7.** 143-165. 11 tables. [14 refs.]

Various media and methods were tried for the production of potent *Cl. chauvoei* vaccines, bearing in mind that the medium and method to be used must be easily applicable to large-scale production. Meat broth (made from horse flesh) plus from 2-5% serum yielded a very potent antigen, but because of the difficulty of obtaining large amounts of serum and of its sterile addition to the medium, it was not adopted as routine. Dense suspensions of washed boiled bacilli produced a high degree of immunity, but this vaccine could not be adopted because too much medium was required to obtain the suspension. The medium and method finally adopted was ox-liver infusion broth (liver particles one-third by volume) plus 1% peptone, 0·85% salt and 1% glucose added after sterilization, pH 7·8, 36 hours' incubation and 0·5% formolization of the culture for three days at 37°C.

Woods, D. D. (1936). **Studies in the Metabolism of the Strict Anaerobes (Genus *Clostridium*). V. Further Experiments on the Coupled Reactions Between Pairs of Amino Acids Induced by *Cl. sporogenes*.**—*Biochem. J.* **30.** 1934-1946. 10 tables. [12 refs.]

W. has continued the work of Stickland on the linked oxidation and reduction of pairs of amino-acids by *Cl. sporogenes*.

It was found that l-cysteine acts as an H donator, and that in the absence of other amino-acids it is partially de-aminated; d-arginine and d-ornithine are both activated as H acceptors, but they are partially de-aminated in the absence of H donators. Ornithine reacts with the donator alanine to accept 2H and is reduced by de-amination to α-aminovaleric acid.

Glycollic acid, β-alanine and taurine are not attacked by *Cl. sporogenes*. —D. L. Hughes.

Klieneberger, Emmy, & Steabben, Dorothy B. (1937). **On a Pleuropneumonia-like Organism in Lung Lesions of Rats, with Notes on the Clinical and Pathological Features of the Underlying Condition.**—*J. Hyg., Camb.* **137.** 143-152. 22 figs. on 1 plate, 1 table. [Numerous refs.]

Report of the isolation of a pleuro-pneumonia-like organism from the lungs of 17 out of 19 rats suffering from a clinically well-known lung condition of rats. The clinical and pathological features of the condition are discussed. *Streptobacillus moniliformis*, a frequent saprophyte of the nasopharynx of rats with lung lesions, may appear as a secondary invader in the lungs in severe cases.—E. J. P.

Basset, J., Macheboeuf, M., & Wollman, E. (1937). Études biologiques effectuées grace aux ultra-pressions : recherches sur les microbes pathogènes et leurs toxines, sur les virus invisibles, les bactériophages et les tumeurs malignes. [**Effects of Ultra-High Atmospheric Pressure on Pathogenic Bacteria and their Toxins, and on Viruses, Bacteriophage and Malignant Tumours**].—*Ann. Inst. Pasteur.* **58.** 58-77. 2 figs. [16 refs.]

An apparatus is described for testing the resisting power of certain micro-organisms and toxic products to pressure greater than that of the atmosphere. The following results are recorded.

Test material.	Range of pressure in atmospheres for total inactivation.
Vegetative bacteria	6 circa
Bacterial spores	20 (failed to kill)
Enzymes	17 ca
Toxins	16–18
Filtrable viruses	3 – 6
Bacteriophage	5 ca
Filtrable neoplasms	2 – 4
Globulin	7 (produced denaturation)

The possibility of using pressure for the production of avirulent or atoxic antigen for immunizing purposes is discussed.—E. J. Pullinger.

Kraneveld, F. C., & Djaenoedin, R. (1936). De aërobe bacteriën-flora van de gal van gezonde runderen uit Midden-Java. [**Aerobic Bacteria in the Bile**

of Healthy Cattle in Mid-Java].—*Ned.-ind. Bl. Diergeneesk.* **48.** 230-239. 2 tables. [10 refs.] [English and German summaries].

The authors examined bacteriologically 50 samples of ox bile and found only 8 sterile. They isolated *Bact. coli* and streptococci for the greater part and also *B. subtilis*, *Proteus vulgaris*, *Bact. aerogenes* and anaerobic organisms. No salmonella were found.

There was no correlation between the fluke infestation of the liver and the bacterial content of the bile.—M. J. J. Houthuis (Rotterdam).

Cannon, P. R., & Walsh, T. E. (1937). **Studies on the Fate of Living Bacteria Introduced into the Upper Respiratory Tract of Normal and Intranasally Vaccinated Rabbits.**—*J. Immunol.* **32.** 49-62. 4 tables. [14 refs.]

C. and W. found that organisms instilled intranasally (staphylococci and pneumococci) spread directly to the lungs. There was no evidence that the organisms penetrated the epithelium of the upper respiratory tract, unless the animals were held in abnormal positions or were under anaesthesia while being dosed.

Intranasal vaccination with a formalin-killed suspension of Type I pneumococci did not prevent the spread of the same organism to the lungs, when it was subsequently introduced intranasally, but its subsequent spread from the lungs to the blood was restricted, and its growth in the lungs was inhibited.

The localization of inert particles in the lungs after intranasal instillation depended on the position in which the animal was held. When held horizontally the particles were found in the upper lobes, and when held vertically they tended to localize in the lower lobes of the lungs.—D. L. Hughes.

Andrucci, M. (1936). Contrôle de la méthode de Pauli pour la conservation des souches bactériennes. **[Pauli's Method of Preserving Bacterial Cultures].**—*Boll. Sez. ital. Soc. int. Microbiol.* **8.** 225-229. [3 refs.] [In French].

A. tested Pauli's method of conserving bacterial cultures, but substituted rabbit serum for horse serum. Blood was pooled from several rabbits, defibrinated by shaking and refrigerated for 24 hours. The supernatant was decanted, 0·5 c.c. distributed in ordinary culture tubes and then inactivated at 55°C. for 2 hours. These tubes were inoculated with the culture material. Several strains of 31 species were used, and then desiccated *in vacuo* for 8 to 12 days. Two years later 87·5% of the cultures proved to be practically unaltered. Even after 4 years the majority of strains tested were viable. When defibrinated rabbit blood was substituted for serum, 14·5% more strains were viable when tested at the two-year period.—C. V. Watkins.

White, P. B. (1937). **Remarks on Bacterial Taxonomy.**—*Zlb. Bakt. II.* **96.** 145-149. [In English.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 521-522. Signed W. W. C. Topley].

In this interesting and stimulating paper, the author makes a plea for the extended use of serological methods as a basis for a rational, that is a " natural " system of bacterial classification. Such methods should, as he emphasizes, be combined so far as possible with the chemical analysis of the antigenic components of which bacterial cells are composed. That such methods, critically and intelligently employed, are capable, as no other known methods are capable, of defining bacterial groups and revealing the interrelationships of the species or types of which they are composed, has been amply demonstrated by studies on the antigenic structure of the Salmonella bacilli, and of other bacterial groups. That this particular technique has developed in the limited field of medical bacteriology is a historical

accident, which should not prejudice its extension to those numberless species that have no pathogenic action.

The final paragraphs of the paper may well be quoted verbatim.

" Substantive and serological taxonomy, undeveloped as it is, has strength in the general unanimity of its students : with rare and glaring exceptions they are in agreement as to the facts and as to their interpretation. It is improbable that medical bacteriologists will abandon the structure to which they have set their hand, or that nonconformity of others will influence their course.

" It is greatly to be hoped that experts in all fields of bacteriology will seriously consider and investigate the possibility of a serological and substantive basis for bacterial taxonomy, improving on and adding to the methods at present available. The present call is not for newer, more ingenious, more pretentious, systems of classification, but for patient and incisive investigation."

DISEASES CAUSED BY PROTOZOAN PARASITES.

I. van Hoof, L., Henrard, C., & Peel, E. (1937). Sur la transmissibilité cyclique de Trypanosomes " brucei " et " congolense " conservés depuis longtemps dans les laboratoires. [**Cyclical Transmissibility of** *Tryp. brucei* **and** *Tryp. congolense* **Kept for a Long Time in a Laboratory**].—*Ann. Soc. belge Méd. trop.* **17.** 63-76. Numerous tables. [4 refs.]

II. van den Branden, F. (1937). Recherches sur la transmission de Trypanosoma " brucei " par le lait maternel. [**Transmission of** *Tryp. brucei* **by Maternal Milk**].—*Ibid.* 57-58. [6 refs.]

III. Wittebolle, P. (1937). Observations chez le rat et la souris sur l'hérédité de l'infection par " Trypanosoma gambiense ". [**Congenital Infection with** *Tryp. gambiense*].—*Ibid.* 123.

I. Duke (1934) has shown that when certain trypanosomes are submitted to a series of mechanical passages through laboratory animals they lose their faculty of cyclical development in the bodies of glossina flies. H., H. and P. conducted similar experiments with *Tryp. brucei* and *Tryp. congolense*. They obtained strains of these parasites, which had been maintained by animal passage in the laboratory for a considerable time, and inoculated them into g. pigs and goats. Glossina, after being allowed to feed on them, were dissected for evidence of intestinal infection. *Tryp. brucei* was found present and developing normally in the body of the fly but *Tryp. congolense* had lost its power of evolution in this manner.

II. Lafranchi (1917) drew attention to the possibility of the transmission of trypanosomes from mother to offspring through the medium of the maternal milk. To elucidate this point B. inoculated four female rats with *Tryp. brucei* and watched their young over a period of three months for evidence of infection. The results in all cases were negative.

III. The possibility of hereditary transmission of trypanosomes has received much attention. W. reports that he inoculated rats and mice with *Tryp. gambiense* and examined their young at birth and over a period of two to three months for the presence of the parasite. The results in all cases were negative.—C. Davenport.

French, M. H. (1936). **The Nitrogen and Mineral Metabolism during a Chronic Case of** *Trypanosoma congolense* **Disease in an Ox.**—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 73-77. 7 tables. [3 refs.]

Complete details are given of balance experiments showing that in chronic as well as in acute *Tryp. congolense* infection a condition of acidosis results. There is an increased excretion of N, Ca, K, and P. Na and Cl excretion was increased when small quantities only were consumed. Mg balances do not show significant alterations.—S. A. Evans.

French, M. H. (1936). **The Nitrogen and Mineral Metabolism during Acute Infections of Sheep with** *Trypanosoma brucei.*—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 77-81. 7 tables.

Metabolic balance experiments on sheep infected with *Tryp. brucei* showed that N, Ca, and K were excreted in greater amounts than normal. Mg and P balances showed only slight alterations. Na and Cl gave negative balances after infection on low salt diets, but on a salt-rich ration retention was possible, though at a lower rate than in the control.—S. A. Evans.

French, M. H., & Hornby, H. E. (1936). **Studies Concerning the Effect of The Plane of Nutrition on the Course of Animal Trypanosomiasis. III.** *T. congolense* **Disease from Crisis to Recovery. IV.** *T. brucei* **in Sheep from Infection to Death.**—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 49-64 and 64-73. 15 figs., 19 tables. [See also *V. B.* **6.** 646].

I. Detailed experiments supporting the earlier work of F. and H., showing that in *Tryp. congolense* infection of cattle and sheep no plane of nutrition above that of bare maintenance affects the contraction of the disease. Submaintenance diets do not allow recovery to take place but, once the crisis is past, recovery is probably determined by the nutritional plane. A good ration of hay and cotton-seed allowed recovery of weight and the attainment of fair " bloom ", but until Ca and Fe were also added complete recovery from the anaemia of the disease was impossible. The powers of digestion are uninfluenced by the trypanosome infection.

II. In acute fatal infections with *Tryp. brucei* in sheep, experiments on (a) a bare maintenance hay ration, and (b) a productive ration of hay and protein and mineral supplements, showed that the course of the disease is not favourably influenced by improved nutritional planes. The digestive powers are not impaired by the infection. Walking in search of food in the hot sun does not result in a more rapidly fatal infection than when the animal is housed.—S. A. Evans.

A. Schilling, G., Schreck, H., Neumann, H., & Kunert, H. (1935-1936). Versuche zur Schutzimpfung gegen Tsetsekrankheit. II. Teil. III. Teil. IV. Teil. V. Teil. VI. Teil. [**Immunization against Fly Diseases. Parts II, III, IV, V and VI**].—*Z. ImmunForsch.* **85.** 513-528, **87.** 47-71, 482-518, **89.** 112-114 and 279-295. 21 figs., 30 tables. [Numerous refs.] [See also *V. B.* **5.** 802].

B. Schilling, G. (1936). Versuche zur Schutzimpfung gegen Tsetsekrankheit. VII. Teil. [**Immunization against Fly Disease. Part VII**].—*Ibid.* **89.** 306-311.

C. Schilling, G. (1936). Immunisation contre les maladies à trypanosomes. [**Immunization against Trypanosomiasis**].—*Bull. Soc. Path. exot.* **29.** 886-888.

A. & B. This series of articles records experiments and observations made during a study of animal trypanosomiasis in Tanganyika Territory, and a continuation of that study in Germany using strains of trypanosomes from African tsetse fly. The majority of the work has been recorded elsewhere [*V. B.* **5.** 122, 618 and 802, **6.** 502, and **7.** 375].

II.—Records that calves which had been treated by the inoculation of minimal doses of trypanosomes, or with the dried blood of infected rats appeared to resist exposure to tsetse fly better than untreated controls, but that the loss during immunization by the minimal dose method might be heavy.

III.—Records experimental work on antibody production caused by

trypanosome infection. *In vitro* attempts to estimate the antibody content of serum were irregular, and instances were encountered in which suspensions containing motile trypanosomes proved non-infective whilst suspensions in which no living organisms could be detected proved infective. By inoculating mice with mixtures of trypanosome suspensions and serum, an antibody which rendered the mixtures uninfective could be demonstrated in the case of the old laboratory strains, provided that the trypanosome suspension was not too heavy and the serum was fresh. Antibody production could only be demonstrated exceptionally in infections by the East African trypanosome strains isolated in 1934. Relapse strains may have the same antigenic value as the original infecting strain and recovery from a relapse strain may produce an antibody against the original strain, although the antibody against the latter will not protect against the former. Attempts were made to ascertain the antigenic value of dried trypanosomes and trypanosomes killed by heat or by drugs either *in vitro* or *in vivo*. Indications were obtained that dried trypanosomes might cause some antibody production, but that organisms killed by drugs were unsatisfactory as antigens. It is considered that immunity depends on the protection given by a residual infection to superinfection and that true recovery probably rarely occurs and is difficult to prove. In some cases antibody disappears from the blood, and this may indicate sterile recovery. In one case it was noticed that with the appearance in the blood of the antibody to a relapse strain, the antibody to the original strain disappeared. The antibody that was present in the blood of the dam, was found to be present in the blood of a new-born foal.

IV.—Records investigations into infectivity and it is noted that, while it was possible to obtain infection by inoculation with a single organism of the old laboratory strains, this was not possible with the recently isolated strains. Inoculation with small numbers of organisms did not regularly cause infection, nor did the feeding of infected flies. The inoculation of trypanosomes from a late stage of infection, compared to inoculation from an early stage, caused a marked lengthening of the incubation period, but a reduction in the period of survival. A description of the types of trypanosomes used in the experiments is given in this section. It is suggested that the salivary gland stage of the trypanosome is not infective, but only the forms found in the hypopharynx. Only about 14 % of animals bitten by flies carrying *Tryp. congolense* became infected, and it is considered that infection is only produced if the proboscis is inserted deep enough to reach the capillary blood vessels.

V.—Describes investigations into the immunization of mice against *Tryp. congolense* infection by the inoculation of minimal doses of trypanosomes. 23 mice were inoculated with doses of trypanosomes commencing with 20 organisms and rising, in the survivors, to 200 organisms. Up to the inoculation of 100 organisms 15 mice died, trypanosomes being detected in two of them; five of the deaths occurred after the first inoculation of 20 organisms and the remainder in small numbers at each stage. With a dose of 200 organisms, four of the remaining eight mice survived, but in unprotected controls the loss was 100 %. [The number of controls is not stated]. An attempt to protect a dog by giving 8 doses of 20 to 30 organisms, followed by infected blood, was apparently successful, as the animal was still alive on the 173rd day, whilst unprotected controls died after 23 and 56 days.

VI.—A record of results of treatment with " naganol ", " antimosan " and " surfen C ". One case is recorded of an apparently sterile cure of a *Tryp. brucei* infection in a horse after treatment with " salvarsan " followed by the intramuscular injection of antimony trioxide in oil. Complete cure was not obtained with

" naganol " and the treatment of *Tryp. congolense* infections with " surfen C " was not followed by satisfactory results. Cases are recorded of apparent recovery after treatment in which injection of adrenalin allowed of the detection of trypanosomes in the peripheral blood, though animal inoculation had been negative. It is suggested that passage of a trypanosome strain through tsetse may alter its reaction to drug treatment, and one experiment is quoted to show that the action of a drug may depend on the stage of infection at which it is used.

This section also contains descriptions of the forms of flagellates encountered is tsetse. True crithidial forms were only found in the proboscis in *Tryp. congolense* and *Tryp. brucei* infection, but one crithidial form was encountered in the salivary gland in a fly infested with *Tryp. rhodesiense*. It is considered that it is uncertain whether crithidial or trypanosome forms are infective to the mammalian host. No sexual conjugation could be detected. *Glossina morsitans* was found to be infective 18 to 20 days after an infecting feed, and it was easier to infect if the blood meal was rich in trypanosomes. The blood of 3-week-old calves was found to be infective on subinoculation in doses of 20 c.c. 18 hours after infected tsetse had fed on them.

VII.—Returns to an analysis of the Tanganyika experiments on the immunization of calves, and the results of exposing them to tsetse infection.

C. This article contains the same information as that published in *V. B.* **7**. 875.—U. F. Richardson.

Hornby, H. E. (1936). **Trypanosomiasis of Pigs due to** *Trypanosoma simiae*.—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 43-48. 2 figs. on 1 plate.

The puzzling outbreaks of acute porcine trypanosomiasis, occurring in East Africa and due to a parasite differing in appearance from any well-recognized species, which in recent years have led to much confusion of thought regarding their identity, are now ascribed to *Tryp. simiae* Bruce *et al.*, 1912. The discrepancy is due to the occasional appearance in the pig of unusual forms overlooked by the discoverers of the species. This necessitates an amended description of the species [see *V. B.* **6**. 860].—S. A. Evans.

I. Adler, S. (1936). **Canine Visceral Leishmaniasis with Special Reference to its Relationship to Human Visceral Leishmaniasis.**—*3rd int. Congr. comp. Path. 1936.* **1**. Pt. 1. Med. Sect. 99-111. [15 refs.] [In English : French summary].

II. Shortt, H. E. (1936). **The Transmission of Leishmanial Infections in India.**—*Ibid.* 112-132. [Numerous refs.] [In English : French summary].

III. Caminopetros, J. (1936). Le Kala-azar. Recherches épidémiologiques et expérimentales sur son mode de transmission. [**Epidemiology of Kala-Azar**].—*Ibid.* 133-193. 28 figs., 5 tables. [Numerous refs.] [In French].

I. The natural distribution of the disease is discussed. A. states that the disease occurs in the whole Mediterranean basin. [It has not been recorded in Cyprus].

The symptoms and pathology are discussed. Even heavily infected dogs may show no symptoms, while on the other hand, in dogs with marked symptoms the parasite may be difficult to demonstrate.

Even when no lesions are present the skin is considered to be the most important site for lodgement of the parasite.

Phlebotomus is considered to be the most important means of transmission.

Slight differences in the pathology of the Indian and Mediterranean strains

result in considerable differences in epidemiology. In the Mediterranean, man can be practically excluded as a reservoir of the virus.

L. infantum is a natural parasite of the dog for which it is less pathogenic than for man. The addition of raw meat to the diet further increases the resistance of the dog to the parasite.

II. A summary of available information. S. concludes that the knowledge already obtained, coupled with the results reported by workers in Europe and North Africa indicates that *Phlebotomus* is the vector.

III. The disease in dogs and man is compared. Areas in Greece are described where infection in dogs has apparently little relationship to that in man.

Working with the hamster, strains of varying virulence were observed from dogs and man, and a considerable amount of experimental evidence was obtained to incriminate *Rhipicephalus sanguineus* as a transmitter.

The distribution of *Phlebotomus* in Greece is discussed in relation to the distribution of kala-azar.

Epidemiological and experimental evidence can apparently be produced in support of transmission both by *Rhipicephalus* and by *Phlebotomus*.

—F. H. Manley.

I. Horne Jensen, B. (1937). Trichomonasinfektion hos Kvaeget. [**Trichomonad Infection of Cattle**].—*Maanedsskr. Dyrlaeg.* **48.** 529-535. 1 fig. [1 ref.]

II. —. (1937). Trichomonadeinfektion hos Kvaeget. [**Trichomonad Infection in Cattle**].—*Medlemsbl. danske Dyrlaegeforen.* **20.** 151-168. [3 refs.]

III. Madsen, M. L. (1937). Et Par Tilfaelde af Trichomonade-Abort. [**Cases of Trichomonad Abortion**].—*Ibid.* 29-33.

IV. Hellesnes, A. P. (1937). Trichomonader som årsak til ufruktbarhet og abort hos storfe i Norge. [**Bovine Trichomonad Sterility and Abortion in Norway**].—*Norsk. VetTidsskr.* **49.** 89-93. [5 refs.]

I. The paper is a preliminary one and gives some general information about abortion and sterility in cattle caused by *Trichomonas foetus*. After a short description of the causal organism follow details on the mode of infection (usually by coitus as the bull also may be infected), symptoms, course and diagnosis, principally given according to work on the disease by Küst [*V. B.* **7.** 325]. Up to January, 1937, six cases in six different herds had been reported in Denmark.

II. A general survey read at a local meeting of veterinary practitioners proposes a scheme for its control and eventual eradication, chiefly worked out according to publications by Abelein and Küst [*V. B.* **7.** 325].

III. M. gives a general description of and reports two cases of abortion in cattle due to trichomonad infection. He considers that the disease has existed for a long time in his district (the Isle of Fyen, Denmark). Before the cause of the disease was known he used a watery solution of iodine to irrigate – two days after service – the genital tract of cows that repeatedly failed to conceive after service.

IV. H. here reports the first cases of abortion and sterility in cattle due to trichomonad infection recognized in a herd in Norway. He gives a review of the disease and draws the attention of veterinary practitioners to the infection in order to get information as to the extent to which it occurs in the country.

—Gustav Naerland (Oslo).

I. Sergent, Ed. (1936). Immunité ou prémunition dans les maladies à hémocytozoaires (paludismes, piroplasmoses). [**Immunity or Premunition in**

Diseases caused by Endocorpuscular Blood Parasites (Malaria, Piroplasmosis)].—*Arch. Inst. Pasteur Algér.* **14.** 413-417. [1 ref.]

II. Sergent, Ed., Donatien, A., Parrot, L., & Lestoquard, F. (1937). Nouvelles expériences de comparaison entre les theilérioses bovines de l'Afrique du Nord et celles du Proche-Orient. [**Comparison of Bovine Theileriasis in North Africa and in the Near East**].—*Ibid.* **15.** 58-69. 7 figs. [3 refs.]

I. S. discusses the immunity conferred by recovery from diseases due to haematozoa, and defines " premunity " as resistance to superinfection conferred by the persistence of infection by a parasite of the same species. After the infection is eliminated the host becomes susceptible to reinfection. The protection given may not absolutely prevent superinfection with a different strain of the same parasitic species. The aim in conferring resistance is to ensure a mild initial attack and to maintain infection by repeated reinfection. He claims that true sterile immunity has not been proved to occur in these diseases, but persistence of infection may be difficult to demonstrate owing to the scarcity of the parasite or to its persistence in a form which is not infective.

II. The second paper records experiments to ascertain the amount of protection given by the Palestinian and Algerian theileria against heterologous and homologous strains of theileria. The comparison is made by means of charts representing the severity of the reactions of groups of animals under experiment. The severity of the reaction of each animal is recorded on the chart at a position determined by the maximum percentage of parasitic infection of red cells during the reaction and the sum of the thermometer readings (Centigrade) during the period of fever.

Judged by these criteria the reactions of clean calves are more severe than those of calves carrying the parasites of either strain, whilst in infected calves the reactions caused by a heterologous strain are not markedly more severe than those caused by a homologous strain.

These charts are compared with similar charts prepared from cross-immunity investigations into the relationship between *Th. parva* and *Th. dispar*, in which the reactions provoked by the heterologous strains in recovered animals were as severe as those provoked in clean calves. It is concluded that the theileria of Palestine and those of Algeria are strains of a single species, *Th. dispar*. [If these parasites belong to a single species it is questionable whether the specific name should not be *Th. annulata*].—U. F. Richardson.

Zasuchin, D. N. (1935). Kleśći i problema borbi s piroplazmzom lošadej. [**Ticks and the Problem of Equine Piroplasmosis in S. E. Russia**]. pp. 159. 45 figs. [5 refs.] Saratov: Sarat. Gos. Izd. [Demy 8vo] [R.3]. [In Russian].

This work on ticks is supplemented by articles by Prof. N. N. Ozerskij on clinical examination and therapy in equine piroplasmosis, by N. A. Borodulin on the pathological anatomy of piroplasmosis, by the author himself on the preparation of smears, and by B. K. Fenjuk on the biological bases of prophylaxis and rodent control.

Piroplasmosis was not studied in S. E. Russia until 1929 although ticks caused much damage to horses which, owing to the state of the roads, are still the principal means of transport. From 1929 to 1933 several commissions investigated the tick question in the region, and in 1933 a scientific veterinary institute was founded at Saratov, where the subject was taken up seriously.

Z. has been one of the principal investigators, and he gives a list of the ticks

which infest animals (domestic and wild) in S.E. Russia, also particulars of those which infest horses and a list of local domestic and wild animals, with the ticks which infest them.

The ticks which cause most damage in the region include :– (1) *Dermacentor silvarum* Olen, the adults of which infest horses, camels, cattle, pigs and sheep. The larvae and nymphs infest small wild mammals such as hamsters, hedgehogs, jerboas and susliks. Z. conducted experiments as to the viability of adult *D. silvarum* under laboratory conditions ; (2) *D. niveus* Neum, the biology of which is similar to that of *D. silvarum*, and (3) *Hyalomma volgense* which is thought to pass its whole life-cycle on one host (cattle). It causes decreased milk yield, loss of weight, delay in growth and damage to skin and hair. [*Ixodes ricinus* is only found in parts of S. E. Russia where the climate is not typical for that region].

Z. discusses the probability of *Rhipicephalus schulzi*, *H. volgense*, *Argas persicus* and *D. silvarum* being vectors of *Pasteurella pestis*. *D. silvarum* is a vector of tularaemia. He does not consider that *H. marginatum*, which is but seldom observed, in S. E. Russia, can be the vector of nuttalliasis in that territory.

Equine piroplasmosis occurs in S. E. Russia from the middle of April to the middle of July. Z. blames for its spread the seasonal movements of horses, the lack of sufficient veterinarians to supervise this movement and the carelessness of individual horse-owners.

Nuttalliasis was first diagnosed in S. E. Russia in 1931. At first horses were exposed to infection, in order to secure immunity. As this was found to be unsatisfactory, the usual prophylactic measures and treatment with trypan blue are now used.

A tick control scheme is given in detail, emphasis being laid on dips. Z. considers that spraying, apart from being less efficient, sometimes has a bad effect on the animals. He found that ticks dipped in arsenic solution did not die, but that ticks which were sucking blood when their hosts were dipped did, and he considers that attention should be given to the rough pastures in order to render them less suitable for the existence of the ticks. For the control of equine piroplasmosis it is recommended that a few cows should be grazed on pasture before grazing horses on it. If possible appropriate burning of pastures should be carried out.

Trypan blue has been used with much success against piroplasmosis in the U.S.S.R., both for horses and cattle, as a prophylactic and as a therapeutic agent. It is now prepared in the U.S.S.R.

Stress is laid by the author and by Fenjuk on the necessity for the control of small rodents as an item in a scheme for piroplasmosis control. Fenjuk suggests that the skins and also the fat of small rodents (susliks, voles, lemmings, etc.) should be utilized commercially as a means of controlling their numbers. He considers that really effective rodent control would be difficult in the conditions obtaining in S. E. Russia, but that in places where there are great numbers of rodents, where cattle are watered or kept and where ticks abound, periodical clearances should be made.

Prof. Ozerskij describes anaemia in piroplasmosis, the heart symptoms connected with the disease, and the leucocyte blood picture. He also discusses treatment. Borodulin's article on the pathological anatomy of the disease contains nothing new.

Gousseff, W. F., Rastegajeff, E. P., & Soussko, S. F. (1936). Die Zecken als Ueberträger der Babesiellosen und Françaiellosen der Rinder. [**Ticks as Vectors of Bovine Babesiasis and Françaielliasis**].—*Arch. wiss. prakt. Tierheilk.* **71.** 138-144.

In addition to *Babesia bovis* transmitted by *Ixodes ricinus*, it has been suggested that two other piroplasms, *Françaiella* (*Babesia*) *caucasica* Yak. & Bel. and *F.* (*B.*) *occidentalis* Yak. & Bour., cause piroplasmosis of cattle in White Russia. This paper records the experimental transmission to calves of *B. occidentalis* by the tick *I. persulcatus* Schultze, both in the larval and adult female stage. This tick, in all three stages, was also shown to be able to transmit *B. bovis*. A mixed infection of the two piroplasms was transmitted by a single female tick.

Infection of a calf by *B. bovis* did not result in its subsequent immunity from infection by *B. occidentalis*.—J. MacLeod.

Sen, S. K., & Srinivasan, M. K. (1937). **Theileriasis of Cattle in India.**—*Indian J. vet. Sci.* **7.** 15-37. 3 text figs., 1 fig. on 1 plate, 4 tables. [Num. refs.]

The authors describe two acute and fatal forms of theileriasis in India :– (1) in imported Friesian bulls – probably infected before arrival, the parasite resembling *Th. annulata*, and (2) in Indian cattle – with which the paper mostly deals – the parasite closely resembling *Th. dispar*. They record the first success in producing the disease experimentally in hill bulls. 44 passages have been carried out, involving 273 bulls, without apparent attenuation or exaltation of virulence. The organism was viable after 4 days at room temperature, but not after 6 days in a refrigerator. The parasite is specific to cattle. The average period of incubation is 16 days, and in fatal cases the average duration of the disease is 5½ days. The existence of anisocytosis, polychromatophilia and granular basophilic degeneration indicate recovery. It was not possible to produce disease by inoculation of filtered blood or filtered serum. In a test on 10 recovered cases (after from 5 to 78 weeks) all proved to be immune. In an experiment to produce " premunition " in 12 bulls by injecting blood withdrawn at the commencement of fever, one died and the remaining 11 proved resistant to inoculation 6 weeks later. Attempts at curative treatment and prophylaxis are described, but were unsatisfactory.—E. E. Jelbart.

Koffman, M. (1937). Till frågan om protozoernas betydelse vid trumsjuka. [**Connexion between Protozoa of the Rumen and Tympany**].—*Skand. VetTidskr.* **27.** 45-70. 6 figs., 11 tables. [English summary].

Outbreaks of a number of simultaneous cases of tympanites in a flock of sheep, for which no plausible reason could be given, led the author to undertake a preliminary study of the micro-fauna of the rumen content both of affected live and dead sheep and of healthy controls from the same grazing. The protozoan fauna was found altered, both quantitatively (the total number decreased, from the normal of about 500,000 per c.c. of ingesta) and qualitatively (the ratio of small to large species – a decrease of the larger species). The suggestion is made that these alterations may account for changes in the bacterial flora, consisting in a prevalence of gas-producing species.

The pH of the ingesta of the rumen was found to depend on the kind of food consumed. In cases of rapid distention the reaction was acid, whereas a neutral reaction was observed to yield the most favourable condition for the generation of protozoa. The average temperature of the rumen content of normal sheep was found to be about 40°C.—Gustav Naerland (Oslo).

Fitch, L. W. N. (1937). **Coccidiosis in Poultry.**—*N.Z. J. Agric.* **54.** 274-278. 2 figs.

The paper draws attention to the serious extent of infection with coccidia in New Zealand poultry, both the caecal form in chickens and the form in young adult birds. Methods of control are discussed.—C. S. M. Hopkirk.

Schüffner, W. A. P., & Walch-Sorgdrager, B. (1937). Infection humaine par *Leptospira canicola*. [**Human Infection with** *L. canicola*].—*Bull. Off. int. Hyg. publ.* **29.** 297-306. 2 tables. 2 charts, [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 704-705. Signed E. H.]

A description of two new cases of human infection with the dog strain of leptospira, *L. canicola*, observed during 1936.

The serum reaction of the first case gave agglutinations of 1 : 100 against *L. icterohaemorrhagiae* as compared with 1 : 3,000 against *L. canicola*; the urine remained negative. In the second case the titre rose to 1 : 10,000 against *L. canicola* and was only 1 : 300 against *L. icterohaemorrhagiae*. A strain of *L. canicola* was obtained by inoculation of the urine into a guineapig, which showed a very benign infection. In this case the source of infection was probably a dog owned by the patient's family, which showed an agglutination of 1 : 30,000 against *L. canicola* and only a doubtful reaction in 1 : 10 dilution against the ordinary strain.

The authors give a brief summary of the three European leptospiroses which are well defined by their clinical, bacteriological and epidemiological characters. The first of these is the ordinary Weil's disease caused by *L. icterohaemorrhagiae*, and is spread throughout the world; the second type caused by *L. canicola*, a dog strain, up to now has been found only in Holland; the third is the so-called "Slime Fever," which causes symptoms resembling an intestinal form of influenza.

Mascaró Garcia, D. F. (1936). Mecanismo del acceso palúdico. [**Mechanism of the Malarial Paroxysm**].—*Crón. méd., Lima.* **53.** 421-432. 8 tables. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 780. Signed H. H. S.]

The author has carried out a study of the conditions of the blood of animals – rabbits and dogs – under normal conditions and during histamine shock, recording the numbers of erythrocytes and leucocytes and the differential percentages of the latter in the peripheral blood before administration of histamine and in both peripheral and visceral blood during histamine shock. The results are compared with similar records in three stages of five patients with malaria paroxysms. In these he examined also the calcium and phosphorus, the blood pressure and coagulation time. He concludes :–

1. The corpuscle changes due to the parasites determine the clinical manifestations.

2. As the result of abnormal corpuscular metabolism, especially as regards the haemoglobin, toxic substances are produced and are discharged into the plasma when the merozoites are liberated.

3. These proteotoxic substances by an allergic process give rise to the malarial attack, which may thus be regarded as due to proteotoxic shock.

4. In producing the symptoms, histamine by its action on the sympathetic or parasympathetic plays an important part.

5. The body, especially by the reticulo-endothelial system, by exercise of its "antixenic" function [*i.e.*, reaction to the presence of foreign substances] brings about a return to normal.

DISEASES CAUSED BY VIRUSES.

Salaman, R. N. (1937). **Plant Viruses and their Relation to those Affecting Man and Animal.**—*Lancet.* **232.** 827-833. 1 table. [Numerous refs.]

This paper provides an interesting review of the common factors in virus diseases of plants as compared with those of man and animals. Commencing with

a survey of the history of virus diseases, S. passes on to a discussion on filtrability, size and growth of different viruses. The isolation of crystalline substances from tobacco mosaic and other plant viruses is described, and the probable nature of these products is reviewed.

The paper concludes with some observations on carriers of viruses in plant pathology, transference by mediate and intermediate means (aphids, thrips, etc.) and the effects of the association of more than one virus in a given plant. The possibility of vaccinating plants by viruses of low pathogenicity is also discussed.
—R. E. GLOVER.

ANON. (1937). **Are Viruses Alive ?**—*Lancet.* **233.** 25. [6 refs.]

A note dealing with certain recent developments of research on plant viruses. W. M. STANLEY (1935) isolated from Turkish tobacco plants infected with mosaic disease, a crystalline protein having the characters of the virus. Other workers have since isolated similar proteins from virus diseases of other plants.

" The fact that the same peculiar crystallisable protein has been obtained from such divergent species of plants as phlox and tobacco and that a solution of this protein has always proved virulent in high dilution is strong evidence in favour of Stanley's view that this protein is the virus ".

Further, there are variants of the tobacco virus each producing symptoms that differ from those caused by the parent strain.

Heavy proteins with chemical and physical characteristics that distinguish them from that originally isolated by STANLEY and from each other have now been isolated from such variants indicating that, when mosaic virus mutates, the change is associated with a change in the protein which the variant produces in the plant that it infects. As it has not been possible to separate the heavy protein from a hypothetical virus impurity and change in the protein isolated from variants of the virus is associated with such change ; " it is not easy to object to his [STANLEY's] conclusion that this high molecular protein is the virus ".

Examination of the protein by means of X-ray photography and optical methods tends to confirm the chemical work and indicates that it may be possible to classify these viruses on the basis of X-ray pattern.

The light this work may shed on the general nature of viruses is discussed. Since the proteins can be obtained in a crystalline form without loss of activity they appear to belong to the non-living world.

"How are we to reconcile this with the ability of virus to multiply and to cause contagious diseases that spread like diseases due to living micro-organisms, and their ability to give rise to variants. But can there really be any sharp dividing line between the living and the non-living ? As one passes downwards in the scale of living things a point must be reached at which it is extremely hard to say whether one is dealing with the animate or inanimate, and it is possible that in the no-man's land between the two worlds agents will be found like these viruses, which partake of the characters of both. As STANLEY says, the enormous size of the molecules of these virus proteins may allow of sufficient complexity of structure for them to behave in some respects like organised beings. How many viruses will prove eventually to be of the same nature as these plant viruses it is impossible to predict, but already evidence is adduced that one at least of the animal viruses – that of the Shope rabbit papilloma – is a heavy protein. It seems fairly safe to assume, on the other hand, that the large animal viruses, like the virus of psittacosis and the viruses of the pock diseases, are more highly organised agents belonging more definitely to the living world."—W. A. P.

HAAGEN, E. (1936). Die Bedeutung der Gewebezüchtung für die experimentelle Virusforschung. 3. Mitteilung. [**Value of Tissue Culture in Virus Research. III**].—*Arch. exp. Zellforsch.* **18.** 360-407. [Numerous refs.]

A review of the literature since 1932 on the culture of viruses and rickettsia

on tissue cultures including the developing egg. The following viruses causing disease in domestic animals are included :– variola-vaccinia, sheep pox, fowl pox, influenza, Rift Valley fever, psittacosis, rabies, Aujeszky's disease, foot and mouth disease, vesicular stomatitis, equine encephalomyelitis, swine fever, "louping ill", rabbit myxoma, rabbit fibroma, virus III of rabbits, ectromelia, fowl plague, avian laryngotracheitis, avian leucosis and Kikuth's canary virus.—J. E.

I. Delpy, L. (1936). Sur la préparation du vaccin antipestique desséché, hors du laboratoire, avec un matériel simplifié. [**A Dried Rinderpest Vaccine**].—*Rec. Méd. vét. exot.* **9.** 145-151. 3 figs. [5 refs.]

II. Robles, M. M. (1937). **Dextrose-Fermenting Aerobes in the Spleen and Lymph Glands of Rinderpest Infected Cattle.**—*Philipp. J. anim. Indust.* **4.** 5-11. 2 tables. [8 refs.]

III. Nayar, P. U., & Srikantaiah, G. N. (1937). **Duration of Immunity in Amrit Mahal Cattle Inoculated with Goat Virus Alone against Rinderpest.**—*Indian vet. J.* **13.** 344-351. 3 figs. on 1 plate. [13 refs.]

I. A description is given of a very simple, inexpensive method of making small quantities of the vaccine ; D. has already described the methods for producing large quantities [*V. B.* **6.** 328]. The original should be consulted for details of technique which do not lend themselves to abstraction. Contamination of the vaccine by pathogenic organisms need not be feared as production is carried out with physiological saline containing 0·06 % formalin. It is not necessary or desirable to neutralize the formalin with ammonia, and it would be contrary to the principle upon which the technique is based.

D's former conclusions [*V. B.* **6.** 509.] concerning the duration of the potency of the vaccine have been confirmed. Immunity conferred lasts for one year in Irani and European breeds of cattle.

II. The work was undertaken to determine the type, behaviour and incidence of dextrose-fermenting aerobes in the spleen and lymph nodes of newly killed rinderpest-infected cattle, and to indicate a method of eliminating them from rinderpest vaccine. All the strains isolated were of the *coli-aerogenes* group, indicating that the alimentary tract was the probable source of contamination. They were found mostly in the visceral lymph nodes, less frequently in the spleen and fewest in the body lymph nodes. Two strains were fatal to g. pigs and produced a local and general reaction in cattle. When stored in an ice-chest, none withstood two months desiccation nor for ten days when suspended in a solution treated with 0·4 % chloroform. Their elimination is thus feasible under favourable conditions.

III. The investigation was carried out under field conditions in Mysore, and 113 Amrit Mahal cattle, which had not previously been given any kind of protective treatment, were used. Each animal received 1 c.c. of goat rinderpest virus alone. Later, their susceptibility to the disease was tested by inoculation of 5 c.c. of bovine virus – 48 animals after three weeks, 15 after six weeks, 25 after eight months, and 25 after two years, nine and a half months. None reacted to the test dose. The virulence of the initial and test doses was demonstrated. The cattle, as regards age, were evenly distributed in the batches.—G. Williamson.

Vitale, A. (1936). Ricerche sull-indice refrattometrico del siero di sangue dei bovini produttori di siero iperimmune antipestoso. [**Refractometric Index of the Serum of Hyperimmune Rinderpest Cattle**].—*Boll. Soc. ital. Biol. sper.* **11.** 63-64.

Using a Zeiss refractometer and testing the serum immediately before and at intervals after the administration of four litres of virulent rinderpest blood, V. showed that its refractive index fell between the first and the fourth bleedings. He considers that in order to pick out those animals which recuperate quickly between bleedings, a knowledge of the refractive index of their serum would be very useful. An animal with a refractive index below 1·348 should not be used for serum production.—J. A. NICHOLSON.

I. DSCHUNKOWSKY, E. (1936). Einige Bemerkungen über die Epizootie der Maul- und Klauenseuche im Jahre 1932 in der Donauebene. [**Foot and Mouth Disease in the Danube Plain in 1932**].—*Dtsch. tierärztl. Wschr.* **44.** 565-566. [1 ref.]

II. SCHMALTZ. (1937). Der Zug der Maul- und Klauenseuche 1936. [**Foot and Mouth Disease in Germany in 1936**].—*Berl. tierärztl. Wschr.* Jan. 22nd. 60.

I. F. & M. disease occurred with normal or mild virulence in 1929 and 1931 in the Danube plain of northern Yugoslavia. In 1932 it again occurred in 19 districts, but in some of them it was extraordinarily acute and caused up to 18% of deaths in the cattle affected, 48% of swine and 1·7% of sheep. The virus was typed as "A" by the Riems institute. Dschunkowsky wondered whether rinderpest or other disease had been superimposed on the F. & M. disease to account for the high mortality, but no evidence of this was collected.

II. Except for the termination of outbreaks which began in 1935 in Schleswig, Germany was free from F. & M. disease in 1936, for the first time since 1909-1910. Details of recent outbreaks are given.—J. E.

WALDMANN, O., KÖBE, K., & PYL, G. (1937). L'immunisation active du bovin contre la fièvre aphteuse par le vaccin formolé. [**Immunization against Foot and Mouth Disease by a Formolized Vaccine**].—*Bull. Off. internat. Epiz.* **13.** 825-844. 8 tables. [5 refs.]

The technique for the preparation of a formolized vaccine is described. For the preliminary experiments upon g. pigs, the vaccine is prepared from 24-hour g. pig pad epithelium and vesicle fluid. The virus is maintained at a temperature of 25°C. for 24 hours after the addition of 0·15% formalin. The dose of vaccine required for g. pigs is 0·4 c.c. (intraperit. or intracut.). The potency of the vaccine is estimated by its ability to protect g. pigs against generalized lesions. Formolized infected serum will also confer immunity upon g. pigs.

For bovine experiments, two-year-old cattle are used. The susceptibility of the vaccinated animals is tested by contact with infected ones, and not by the direct scarification of the tongue with infective material.

In a preliminary experiment, 12 vaccinated cattle were exposed to direct contact with 5 infected ones; 6 contracted the disease. Since this test was considered to be too severe, each animal was placed in a separate isolation box in the succeeding experiments; the susceptibility to infection was determined by rubbing infective saliva upon the tongue.

The virus is not always found to be attenuated even after prolonged heating for 96 hours at 25°C. Six different vaccines, prepared by a similar technique, were found to contain residual virus when inoculated into susceptible cattle.

The doses for cattle vary from 6 to 12 c.c., inoculated (subcut.) into the dewlap; a tumour-like thickening of the subcutaneous tissues sometimes results. There is no general systemic disturbance.

The maximum degree of immunity is attained 13 to 17 days after inoculation,

and it does not diminish after four weeks ; the duration of immunity has not been investigated for longer periods.

Ten cattle were inoculated with a vaccine prepared from a strain of virus which had been repeatedly passaged through cattle ; they were later proved to be immune to this strain of virus. Subsequently, five of these animals were found to be susceptible to infection with a fresh, non-passaged strain of the same type of virus.—E. C. Hulse.

Hofferber, O. (1937). Verbreitung und Feststellung der ansteckenden Blutarmut der Einhufer unter besonderer Berücksichtigung des Blutbildes. [**Incidence and Demonstration of Equine Infectious Anaemia with Special Reference to the Blood Picture**].—*Veröff. Jber. beamt. Tierärzte Preuss., 1933-1934.* Pt. II. pp. 357-448. 10 tables, 19 graphs. [Numerous refs.]

E.I.A. was first observed in Germany in 1904 by Ostertag in the governmental district of Trèves (Rhine), since when it has spread across Germany as far as East Prussia. The incidence between 1918 and 1935 is detailed with the aid of maps and graphs. In 1935 it was present in all but 10 of the 34 governmental districts, being most prevalent in Cassel, Hessen-Nassau and Hohenzollern. By an order of May, 1934, diagnosis was officially based on the results of (1) clinical-epidemiological investigation ; (2) the blood picture ; (3) periodical temperature taking in suspected cases ; (4) *post-mortem* examinations with (5) histological examination of internal organs. Numerous reports on this system are given.

For (5) the following changes are considered to be characteristic :- the liver capillaries are often dilated near the central veins and are surrounded by iron-carrying cells, endothelial cells or Kupffer cells, which may or may not be detached. The liver cells themselves are unchanged ; the spleen is rich in erythrocytes and poor in iron-bearing cells ; the pulp elements including follicles are shrunken ; petechiae may be present under the capsule. The interstitial tissue of the kidney cortex is infiltrated with lymphoid cells and leucocytes and contains small haemorrhages ; the glomeruli are somewhat swollen and may contain iron-bearing cells, whilst the tubular epithelium is normal or may show the early stage of necrosis. These changes are caused by acute febrile attacks and are more severe in animals that have been affected with the chronic form.

The intramuscular tissue of the heart is loaded with cells and the muscle cells often show fatty infiltration. The endocardium of the auricles is thickened and contains lymphoid cells, lymphocytes and a few connective tissue cells. The cause of E.I.A. is thought to be a filtrable but not ultra-filtrable virus which is bound up with the blood serum or albumin. It is rather resistant to physical and chemical influences. It is present in the blood and body organs and is excreted with the natural excretions and secretions and can pass to the foetus *in utero*. The virus can remain alive for a time in pigs, rabbits, g. pigs, fowls and pigeons and, it is claimed by some, evidently also in man. Artificial infection of horses is easy with blood, the incubation period varying between 1 and 93 days.

The blood picture in E.I.A. is discussed in detail : the large majority of cases show a fall in R.B.C. and Hb content and a partial decrease in W.B.C.—J. E.

I. Pflieger, & Carpentier. (1936). Une épizootie d'anémie infectieuse sur les chevaux de la place de Belfort. [**An Outbreak of Equine Infectious Anaemia**].—*Rev. vét. milit.* **20.** 263-294. 6 tables, 3 graphs. [3 text refs.]

II. Homutov, P. (1936). Recherches sur la pathologie, la physiologie pathologique et la traitement de l'anémie infectieuse du cheval. [**Pathology of Equine Infectious Anaemia**].—*Bull. Off. internat. Epiz.* **13.** 1-36.

III. Griffin, C. A., & Brose, C. P. (1936). **Report of an Outbreak of Equine Infectious Anaemia, with Observations on Blood Changes.**—*J. Amer. vet. med. Ass.* **89.** 664-670. 2 figs. [4 refs.]

I. A French military veterinary study of E.I.A. which first made its appearance in the French army in 1904 but since 1931 has become a serious problem. This is particularly the case in the region of Belfort where a virulent centre of infection exists. The authors give a general review of the disease as met with in the army, beginning with its military history and present distribution. The essential characters of the disease as seen in army animals, the lesions, symptoms, diagnosis and treatment are then dealt with in turn. Some of the authors' views, however, are disputed in editorial footnotes. The article ends with a statement of the incidence of the disease in the various army units at Belfort. Tables of wastage and death covering the years 1932-1936 are included.

II. The work on E.I.A. reported in this article was carried out under the auspices of the Office international des Epizooties. It is devoted entirely to a study of the disease under natural conditions, a military unit at Belfort providing the necessary clinical material. The existing knowledge of the disease in the natural state is reviewed.

H. considers that some improvement is possible in the classification of the clinical forms and he divides the acute and peracute cases into the following three groups, (1) the renal-hepatic cases, which he calls " azotemic " ; (2) the gastro-intestinal, and (3) the mixed forms. The symptomatology, haematology and pathology of the disease are then dealt with in detail.

H. finds that true anaemia exists as an exception rather than the rule and states that only three cases were met with by him in 600 examined. The diagnostic value of certain special symptoms is then considered, namely, the temperature curve, blood cell sedimentation, the flocculation and the volumetric index tests. Treatment is only briefly dealt with. In the final section on immunity there are some original observations on the possibility of acquired protection.

III. G. and B. give details of an outbreak of E.I.A. in New York State involving 14 horses of a stud maintained for laboratory purposes. The article is mainly devoted to a consideration of the blood changes observed, particularly in relation to fluctuations in the temperature curve, the rate of red cell sedimentation and variations in the differential leucocyte counts.—C. Davenport.

Rodionov, I. M. (1936). Opyt vyjasnenija roli drukrylych nasekomych v perenose infekcionnoj anemii lošadej. [**Dipterous Insects as Carriers of Equine Infectious Anaemia**].—*Sovyet. Vet.* No. 12. pp. 11-18.

A group of five affected horses and another group of three healthy horses were confined in the open with a minimum distance of 120 metres between the two groups. During an observation period of 43 days one of the healthy horses contracted E.I.A., and it is suggested that transmission may have been effected by one or other of insects prevalent at the time, namely, *Chrisozona pluvialis*, *Tabanus maculicornis* or *T. lapponicus*.

Records, E. (1937). **The Epidemiology and Control of Equine Encephalomyelitis.** —*J. Amer. vet. med. Ass.* **90.** 373-380.

R. summarizes the research work carried out on eq. enceph. of horses. The epidemiological features and measures by which control of the disease may be attempted are discussed. Knowledge of the epidemiology is fragmentary and it is stated that the means by which the virus is maintained and disseminated and invades the horse under strictly natural conditions have not been ascertained.

Reference is made to the prophylactic value of vaccines—formalin killed horse-brain tissue virus and living virus which has been attenuated and fixed by repeated passage through laboratory animals. The latter, used as a vaccine, is highly antigenic and non-infective. In actual outbreaks where it is desired to confer some immediate protection the use of highly potent antiserum or the simultaneous injection of antiserum and living fixed virus is recommended.—D. R. W.

RATNER, L. S. (1936). Fiziko-chimičeskie issledovanija virusa encefalomielita lošadej. [**Physico-Chemical Research on the Virus of Equine Encephalomyelitis**].—*Sovyet. Vet.* No. 9. pp. 3-9. 4 tables. [French summary].

R. found that the virus of eq. enceph. is not present in the lipoid fractions of the brain of experimental animals.

ALEXANDER, R. A. (1936). **Studies on the Neurotropic Virus of Horsesickness. V. The Antigenic Response of Horses to Simultaneous Trivalent Immunization.**—*Onderstepoort J. vet. Sci.* **7.** 11-16. 3 tables. [1 ref.] [See also *V. B.* **6.** 328].

By *in vitro* and *in vivo* methods it was shown that the simultaneous injection of three strains of neurotropic horse-sickness virus results in the production of a solid immunity against each. The number of animals used was rather limited but there was no evidence of antagonistic action of one strain to another. By the use of three strains simultaneously in the vaccine the use of repeated doses can be avoided. 100 infecting doses of each strain were used in the vaccine. A. mentions that experiments were in progress to determine whether a satisfactory antigenic response would occur if more than three strains were included in the vaccine. —E. M. ROBINSON.

MANNINGER, R., & MARCIS, A. (1937). Versuche mit dem Erreger der Aujeszkyschen Krankheit. [**Experiments with the Virus of Aujeszky's Disease**].—*Z. InfektKr. Haustiere.* **50.** 25-32. [9 refs.]

Evidence is presented to show that the virus circulates and multiplies in the blood stream and that the disease is, therefore, primarily a septicaemia. Following the septicaemic spread, infection becomes established in the nervous tissue.

Attempts to stimulate antibody formation in rabbits by administration of sublethal doses of virus or of inactivated virus (heat or formol) failed. Either the rabbits died of active infection or else they completely resisted all efforts at immunization, no antibodies being formed. Antiserum obtained from convalescent pigs had a strong viricidal effect *in vitro*, but failed to produce passive immunization when inoculated into rabbits.—E. J. PULLINGER.

GERLACH, F., & SCHWEINBURG, F. (1936). Experimentelle Untersuchungen ueber die Ausjeszkysche Krankheit (Pseudowut). II. Mitteilung. [**Research in Aujeszky's Disease. II**].—*Wien. klin. Wschr.* **49.** 551-554. 4 tables. [See also *V. B.* **6.** 514].

The writers have confirmed experimentally some of the present-day knowledge of the nature of this virus and they discuss the difference between it and that of rabies. After examining eight strains of the virus it is concluded that g. pigs, rats and white mice are considerably more resistant than rabbits, requiring larger infective doses and showing longer incubation periods following artificial infection. The incubation period varied with the strains, but inoculation by the intracerebral, intramuscular and subcutaneous routes was followed by similar incubation periods, whilst following intraperitoneal inoculation the incubation

period was prolonged. In infected rabbits, g. pigs and rats the highest concentration of virus was found in the brain and spleen, but a considerable amount of virus was spread throughout the body.—E. J. PULLINGER.

I. HORGAN, E. S., & MCKINNON, R. M. (1937). **A Comparison of the Mesencephalon and Hippocampus as Sites of Election for Negri Bodies in Rabies.** —*J. Hyg., Camb.* **37.** 340-344. 1 table. [6 refs.]

II. COLES, A. C. (1937). **Intra-Endothelial Bodies in the Vessels of the Brain and Spinal Cord in Rabies.**—*J. Path. Bact.* **44.** 315-319. 12 figs. on 1 plate. [9 refs.]

III. LEVADITI, C., SCHOEN, R., & REINIÉ, L. (1937). Virus rabique et cellules néoplastiques. [**Rabies Virus and Neoplastic Cells**].—*Ann. Inst. Pasteur.* **58.** 353-376. 13 figs. [8 refs.]

I. Various workers have recently questioned the choice of the hippocampus as the predilection seat of Negri bodies. Examinations of the mesencephalon and oculomotor nucleus in rabid brains have been described as yielding a greater percentage of positive results. These comparisons have been made in experimentally infected animals, and usually with fixed virus. H. and McK. have made transverse sections of the brains of 37 naturally infected animals, and their results indicate that the hippocampus is much the most frequent site of Negri bodies, and that when the latter are present in the mid-brain they may be small and multiple, possibly suggestive of an early stage of development. Lépine's staining method was chiefly relied upon. 48·6% of cases were positive in the hippocampus only.

II. C. describes observations made on film preparations of brain, cord, and salivary glands of rabid rabbits, monkeys, and dogs infected with various rabies viruses, and of g. pigs infected with Trinidad rabies virus. He describes several types of small bodies, in particular an intravascular body seen in brain and cord preparations, the position of which he likens to that of Rickettsia in typhus and ovine heartwater, for they were frequently found inside the endothelial cells of the vessels. They were round or oval, 0·5-1μ or larger in diameter, and stained blue or faintly red with Giemsa. He concludes by stating that " in rabies the endothelial cells of small blood-vessels in the brain contain small stainable particles which have the appearance of being parasites ".

III. The authors report on some experiments the results of which indicate some type of symbiotic relationship between the tumour cells of Pearce's carcinoma and the Negri bodies of rabies virus. They find that when the neoplasm is grafted into the anterior chamber of a rabbit's eye, if rabies virus is inoculated (either by corneal scarification in the opposite eye or intracerebrally), virus will invest the neoplastic tissue, and serial transplants with the tumour result in rabies infection. The same results hold good if the infection of the tumour material is carried out *in vitro* by immersing fragments in virus and thoroughly washing, prior to inoculation. Tumour tissue infected with rabies grafted on the skin or in the testicle results in rabies infection only with the primary grafts ; serial propagation of the tumour by these routes does not result in rabies. Attempts at infecting tumour grafts in situations other than the eye, such as by intracerebral inoculation, indicate that, with the possible exception of the skin, the same results do not obtain. Successive passages of rabies-infected tumour slowly reduce the proliferating power of the tumour cells, and as this did not occur with non-infected control material it would appear to be an effect of the rabies virus on the neoplasm cells. Histological examinations are described ; Negri bodies were found in the carcinoma cells, most numerous in those layers adjacent to the cornea.

The above results were obtained with street virus; with fixed virus the tumours quickly lost their power to produce rabies.—NORMAN HOLE.

I. KÖVES, J., & KERBLER, N. (1936). A veszettség elleni védőojtasok újabb eredményei. [**Recent Results of Preventive Inoculation against Rabies**]. —*Állatorv. Lapok.* **59.** 29-33. 6 tables. [1 ref.]

II. MÓCSY, J. (1936). A veszettségellenes preventiv ojtások utáni agy- és gerincvelőgyulladásrol. [**Post-Inoculation Encephalomyelitis in Rabies**].—*Ibid.* 142-143. [1 ref.]

III. KERBLER, N. (1936). Veszettséggel fertőzött állatok vedőoltásának egyszerüsitéséről. [**Simplified Vaccination of Animals against Rabies**].—*Ibid.* 363-366. 1 table. [14 refs.]

I. Between 1900 and 1928, 15,000 domestic animals were vaccinated in Hungary against rabies after being exposed to risk of infection and 1·3% of them died of rabies. The corresponding mortality was 3·9% in 1932, 2·5% in 1933, and 1·6% in 1934.

Police regulations have been successful in controlling rabies in Budapest but the authors now advise preventive inoculation there.

II. About 0·25% of dogs vaccinated against rabies in Budapest in 1935 became ill with encephalitis and one-third of them died with general paralysis. *Post-mortem* examination showed the presence of encephalomyelitis without Negri bodies.

III. K. describes the development of Högyes vaccine against rabies. It was usually given to dogs in a series of seven inoculations, which the author suggests might be reduced to five or even less. He was successful in immunizing sheep by five daily doses of vaccine.—Z. DE CZUKAS (MAGYARÓVÁR).

NEITZ, W. O. (1937). **Rabies in South Africa.**—*Fmg S. Afr.* **12.** 130-133. 7 figs., 3 tables.

In this popular article a description is given of the symptoms observed in man, in the various species of domesticated animals and in the meercat family which is the commonest transmitter of the disease in South Africa under natural conditions. A table is given showing the known carriers of the disease in South Africa. The yellow mongoose (*Cynictis penicillata*) is by far the commonest carrier, but the Cape small spotted genet (*Genetta felina*), the Cape grey mongoose (*Myonax pulocrulentus*), the Cape suricate (*Suricata suricatta*), the ground squirrel (*Geosciurus capensis*) and two species of felidae, the blackfooted cat (*Felis negripes*) and the Cape wild cat (*Felis ocreata caffra*) may be carriers as well. The article concludes with recommendations for the prevention of the disease.—E. M. ROBINSON.

I. TORRES, S., & DE QUEIROZ LIMA, E. (1935). A raiva e sua transmissão por morcegos hematophagos infectados naturalmente. [**Natural Transmission of Rabies by Vampire Bats**].—*Rev. Dep. nac. Prod. anim., Rio de J.* **2.** 1-55. 25 figs. on 11 plates, 1 diagram. [17 refs.] [English and French summaries].

II. ANON. (1935). La rabia y su transmisión por los murcielagos hematophagos. [**Rabies and its Transmission by Vampire Bats**].—*Rev. Med. vet., B. Aires.* **17.** 235-250. 4 figs. [10 refs.]

III. TORRES, S., & DE QUEIRCZ LIMA, E. (1935). A raiva nos morcegos hematophagos. (Desmodus rotundus murinus). [**Rabies among Vampire Bats**]. —*Rev. Dep. nac. Prod. anim., Rio de J.* **2.** 385-406. 10 figs. on 5 plates. [English summary].

IV. Torres, S., & de Queiroz Lima, E. (1936). A raiva e os morcegos hematophagos. Morcegos que resistem á infecção tornam-se portadores e eliminadores de virus? [**Rabies and Blood-Lapping Bats**].—*Ibid.* **3.** 165-174. [English summary].

V. Torres, S. (1936). A raiva e a infecção natural dos morcegos hematophagos. [**Rabies and Blood-Lapping Bats**].—*Ibid.* 183-186. [English summary].

VI. Carneiro, V. (1936). As epizootias de raiva na America e o papel dos morcegos hematophagos. [**Rabies in America and the Role of Bats**].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **7.** 273-322. 1 fig., 2 tables. [Numerous refs.] [English summary].

I & II. Two species of vampire bats (*Desmodus rotundus murinus* and *Diphylla ecauda*), have been found to be transmitters of rabies in South America and one infected bat was found in a place where there was rabies in dogs but no paralytic rabies in cattle. Naturally infected bats were confined along with eight infected calves and fed on them, with the result that three calves died of paralytic rabies (encephalitis with Negri bodies) and two died of encephalitis without Negri bodies. The other calves died of intercurrent disease.

It has been found in experiments that in about 90% of instances infected bats transmit rabies to domestic animals. Dogs and rats were somewhat more resistant to rabies than other animals. Rabies virus undergoes no change by passage through bats. Rabies has not been observed in two further species of vampire bats (*Diaemus youngi* and *D. youngi youngi*).

III. The course of rabies in vampire bats was studied. The incubation period was 11 to 17 days and the course that of typical paralytic rabies. Virus was present in the brain and salivary glands of bats, but not in equal amounts; virus appears to pass through the central nervous system and to reach and remain in the salivary glands. Infected bats spread the disease amongst themselves and other species of bats. The brain lesions of infected bats were typical of rabies.

IV. The authors found that a vampire bat can carry rabies virus and can eliminate it for a period as long as 110 days.

V. Two out of three bats (*Desmodus rotundus murinus*) fed on a young goat affected with paralytic rabies and died of rabies. Three hungry bats did not attack a dog that was confined with them for two days nor did two hungry bats attack a dog with paralytic rabies.

VI. This paper is a revision of the extensive literature on epizootic rabies of domestic animals in Brazil and other countries of America.—S. Torres.

Velde, G. (1936). Poliomyelitis acuta und Hundebiss. [**Acute Poliomyelitis following a Dog Bite**].—*Med. Klinik.* **32.** 1667-1669.

A man developed the first symptoms of poliomyelitis eight hours after being bitten by a dog. V. reports the occurrence but considers that it has no significance.
—J. E.

Theiler, M. (1937). **Spontaneous Encephalomyelitis of Mice, a New Virus Disease.**—*J. exp. Med.* **65.** 705-719. 4 tables. [3 refs.]

A virus disease of mice is described the cardinal symptom of which is a flaccid paralysis of the hind legs; young mice are the more susceptible. Artificial infection was possible by intracerebral inoculation of a suspension of the brain and cord from an infected mouse, or, less effectively, by intranasal instillation.

The incubation period was 7-30 days, and the virus was recovered from mice one year after infection: attempts to recover the virus from the blood were negative.

Microscopic examination of the brain and spinal cord showed a perivascular round-celled infiltration, more particularly in the cord, and an acute necrosis of ganglion cells especially marked in the anterior horns. There was evidence of neutralizing substance in animals that had recovered from an intracerebral injection, and these mice were mostly immune to a second inoculation.

The virus was judged to be between 13 and 19$m\mu$ in size and could be preserved for 150 days in 50% glycerin; it could not be preserved by desiccation in the frozen state. The rhesus monkey was not susceptible.—H. H. Holman.

de Kock, G., & Robinson, E. M. (1936). **African Swine Fever Control Measures.**—*Fmg S. Afr.* **11.** 333-334. 2 figs.

The name African swine fever has been used to describe the type of swine fever found in South Africa which is indistinguishable from the type occurring in East Africa. The importance of carriers and the necessity for the destruction of carriers such as the wart-hog and bush-pig in pig-breeding areas is emphasized. A full description of the measures adopted in South Africa to combat outbreaks of swine fever is given.—E. M. Robinson.

Manresa, M., & Mondonedo, M. (1936). **Resistance of the Berkjala Breed of Swine to Hog Cholera.**—*Philipp. Agric.* **25.** 214-220. 2 figs., 5 tables. [6 refs.]

The authors claim that, in the Berkjala pig (Berkshire and native cross), selected *inter alia* for vigour and resistance to disease, progress has been made in developing a strain with high resistance to swine fever. They mention that an outbreak in 1922 left few of the Agricultural Department's Berkjala pigs alive, but that the survivors were vigorous and reproduced rapidly, and that in the next outbreak in 1935, an opportunity was afforded of comparing the Berkjala with two other breeds under identical conditions. The Berkjala compared favourably as regards low mortality and subsequent fertility. Swine fever serum was used in the 1935 outbreak.—E. E. Jelbart.

Gilbert, S. J. (1937). **Infectious Pleuro-Pneumonia of Goats in Palestine: Communicability to Sheep.**—*J. comp. Path.* **50.** 33-38. 1 table, 2 graphs.

Pleuro-pneumonia of goats and to a less extent, of sheep, associated with heavy mortality, occurs in hill districts in Palestine, more especially in severe winters. Enquiries and studies have indicated that the disease is relatively mild unless the animals are exposed to adverse influences such as exposure and conditions that lower vitality. G. reports a small number of transmission experiments which indicate that bacteria-free nasal discharge is infective to sheep and goats when introduced intranasally or intravenously.

The most prominent symptom is a nasal discharge which persists for two to three weeks; increased lachrymal secretion is common; an eruption sometimes occurs on the lower lip, there is loss of appetite accompanied by diarrhoea and the animals became emaciated; the temperature is above normal, but not high. G. concludes that the disease is due to a filtrable virus.—W. A. P.

Rosenbusch, F. (1935). La psittacosis en papagayos importados en la Argentina (*Melopsittacus undulans*). [**Psittacosis in Parrots Imported into the Argentine**].—*9th Reun. Soc. argent. Pat. reg. N.* **2.** 617-623. 6 figs. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 578. Signed H. H. S.]

The author has attempted to determine whether the local parrots suffered from or were infected with psittacosis in a latent form, showing no symptoms. He

found some of them with a severe infection transmissible to white mice, canaries, and less easily to guinea-pigs. No organism could be cultivated but in the cells of the peritoneum of the mice after infection were seen *Rickettsia psittaci* in large numbers. He did not find any positive results among the apparently healthy birds, in other words, there was no evidence of psittacosis existing in a latent form among the Argentine birds, but he advises the appointment of inspectors to safeguard the importation of infected birds.

LESBOUYRIES, M. (1937). La psittacose. [**Psittacosis (Review)**].—*Rec. Méd. vét.* **113.** 279-299. [1 ref.]

Psittacosis in man was first described by JURGENSEN in 1876, as an atypical case of pneumonia. It is primarily a virus disease of parrots and is of importance only because of its transmissibility to man, in whom the death rate is approximately 20%. In the parrot family nearly all species of which suffer from the naturally occurring disease, psittacosis presents no precise symptoms or exact pathological changes. The period of incubation is from 9-15 days, and 3 forms of the disease are recognized. In the peracute form which is rare, an apparently healthy bird dies in coma in a few hours. In the acute form there is fever accompanied by convulsive tremors and painful respiration. There is a mucous exudate in the nasal cavities and eyes and diarrhoea ; death follows in 4-8 days. The latent form shows no clinical signs ; on autopsy, the intestines are inflamed, the lungs oedematous and congested, the liver hard and yellowish in colour, while the spleen is enlarged.

The disease is rarely fatal in tropical countries, but in Europe and the United States, due in all probability to the effects of transport and of a colder climate, death is much more frequent.

Diagnosis in birds of the parrot family is difficult, the most suitable method being intraperit. inoc. of mice with a filtered emulsion of spleen. The mouse may die in anything from 15 hours to several weeks, depending upon the virulence of the strain of virus. *Post-mortem* examination of the mouse shows enlargement of the liver and spleen with a sticky exudate in the thorax and abdomen. The virus itself passes Chamberland L_1, L_2, L_3, Seitz EK and Berkefeld V but not Berkefeld W filters. Soon after the filtrability of the causal agent was discovered, COLE found, in the blood, liver and spleen of persons and birds dead of the disease, coccoid rickettsia-like bodies 0·2-0·3μ in diameter. They stain red with Giemsa's stain, but are best demonstrated with Berry's modification of Castaneda's method. They are diagnostic of psittacosis and, although more easily found in the experimentally infected mouse than in a natural case of the disease, are now held to be the virus itself. There is great variation in the virulence of individual strains, but in some cases it may be augmented by passage. The resistance of the organism also shows some variation, but it is destroyed by heating at 70°C. in 45 minutes, and by 0·5% phenol at 37°C. in 20 hours. Dried parrot spleen has, however, been shown to remain infective for 277 days. Experimentally, all parrots are susceptible, as well as the monkey, rabbit, g. pig, canary and domestic poultry, while mice are the most suitable subjects for diagnostic purposes. The incubation period and type of disease produced depend upon the individual animal or bird, but generally young birds are the easiest to infect.

Man may become infected by direct contact with affected persons, with birds, – which may, however, show no sign of the disease – or in the laboratory. Persons over 40 years of age are most commonly attacked. The death rate is 20%. The treatment of birds is useless and dangerous and in man is mainly symptomatic. Conflicting reports are given on the use of convalescent sera. Prophylaxis is

discussed at some length, but resolves itself into the total prohibition of the importation of birds of the parrot family.—A. Wilson Taylor.

I. Rajagopalan, V. R. (1937). **Is there a Relationship between the Viruses of Rinderpest and Doyle's Disease ?**—*Indian J. vet. Sci.* **7.** 59-64. 2 tables. [1 ref.]

II. Mackenzie, R. D., & Findlay, G. M. (1937). **Variations in Fowl-Pest Virus.**—*Brit. J. exp. Path.* **18.** 138-145. 5 tables. [Numerous refs.]

III. Findlay, G. M., & Mackenzie, R. D. (1937). **The Transmission of Fowl Pest to Ferrets.**—*Ibid.* 146-155. 4 figs., 5 tables. [5 refs.]

IV. Hudson, J. R. (1937). **A Description of a Highly Fatal Virus Disease of Poultry New to East Africa.**—*E. Afr. agric. J.* **2.** 495-497.

I. Two cross immunity tests were carried out. In one the virus of Newcastle disease was inoculated into two bulls and two fowls. The fowls died and one of the bulls showed a rise in temperature following the inoculation. Both bulls were subsequently shown to be susceptible to rinderpest. The other test was made on two bulls and two fowls using rinderpest virus. The bulls developed rinderpest, recovered and acquired immunity. The fowls withstood inoculation and were later found to be susceptible to the virus of Newcastle disease.

II. Two variants of fowl plague virus were produced from a strain supplied by T. M. Doyle and referred to as the Doyle strain ; one by intracerebral inoculation of the virus into canaries, referred to as the canary variant, and the other by intracerebral inoculation of the canary variant into white mice, referred to as the mouse variant.

Tests for pathogenicity in mice showed this to be higher in the mouse variant than in the canary variant, and to be higher in both variants than in the Doyle strain, in which it was found to be quite low.

Sera prepared in the rhesus monkey against the Doyle strain, the canary and mouse variants, and a strain obtained from the National Institute for Medical Research, referred to as the Doerr strain, were found to have about the same virucidal action on the mouse and canary variants of the virus.

III. The strains and variants referred to above were inoculated into ferrets by intraperitoneal, intranasal and intracerebral inoculation. All animals inoculated with the mouse variant died and all inoculated with the Doerr strain recovered. Of those inoculated with the Doyle strain and the canary variant, all died in which the inoculation was intracerebral, but some recovered following intranasal and intraperitoneal inoculation. All inoculated animals that recovered were reinoculated with mouse strain virus and were found to be immune.

IV. A full description is given of the symptoms, *post mortem* appearances, cause and control of a disease which, in the view of the author and from the description given, is indistinguishable from Newcastle disease. No cross-immunity experiments have been carried out.—W. J. Ironside.

A. Paschen, E. (1936). Ueber das Shopesche infectious fibroma of rabbits. **[Shope's Infectious Fibroma of Rabbits].**—*Zlb. Bakt. I. (Orig.).* **138.** 1-14. 4 figs., 5 tables. [15 refs.]

B. Hurst, E. W. (1937). **Myxoma and the Shope Fibroma. I : The Histology of Myxoma. II : The Effect of Intracerebral Passage on the Myxoma Virus. III : Miscellaneous Observations Bearing on the Relationship between Myxoma, Neuromyxoma and Fibroma Viruses.**—*Brit. J. exp. Path.* **18.** 1-15, 15-22 and 23-30. 13 figs. on 6 plates, 8 tables. [Numerous refs.]

C. Shope, R. E. (1937). **Immunization of Rabbits to Infectious Papillomatosis.**—*J. exp. Med.* **65.** 219-231. 3 tables. [4 refs.]

A. Paschen reviewed the literature and confirmed the findings of others who had worked with the virus of infectious papillomatosis of rabbits. During the course of the experiments mutation of the virus was encountered. Record is made of the discovery of the exciting agent which takes the form of an elementary body. Great numbers were found in scrapings from skin lesions produced by the inflammatory strain of virus ; they were also found to be present in the lesions produced by the fibromatous strain. In stained preparations the bodies appeared as very small round structures and were estimated to be about 0·15μ in size.

B. Hurst describes in detail the course of the infection and the histology of the lesions produced in rabbits by a virulent strain of myxoma virus. Skin, lymph node, spleen, lung, liver, adrenal gland, testis, omentum and kidney lesions were studied. It is considered that the effects of infection of epithelial structures with myxoma virus are not widely different from those in many other virus diseases in that early proliferation gives place to degeneration and necrosis. The vascular lesions described are considered to be without parallel in any other pathological condition. In affected vessels the endothelium was over-active to a degree never seen by the author in any other condition ; the cells were proliferating actively and both the body and nucleus were greatly enlarged. Such lesions are severe in the skin, often present in lymph nodes and lung and may be seen in some degree in most sites affected by the virus. They are more frequent in capillaries and venules than on the arterial side of the circulation. In general, other mesodermal structures such as reticular endothelium, histiocytes and fibroblasts tended to undergo proliferation while epithelial and some mesodermal structures such as muscle tended to degenerate and die when attacked by the virus. In some situations the myxomatous cells appear to elaborate an abnormal product which stains with muci-carmine.

Experiments were carried out with myxoma virus which had been passaged in series intracerebrally in rabbits. During the course of passaging, the virus gradually underwent a well defined modification. The disease produced by the altered virus (neurovirus) clinically was myxoma, but it was milder in its manifestations than ordinary myxoma and in the majority of instances was non-fatal. In circumstances especially favourable to multiplication (after intratesticular inoculation) the neurovirus usually killed although two testicular passages did not cause the virus to revert to its original characters. No increased tendency on the part of neurovirus to invade the central nervous system after peripheral inoculation was found. Histologically the lesions produced by neurovirus were not typically myxomatous, epithelial changes were much the same as in classical myxoma, but the transformation of various mesodermal cells into myxoma cells was lacking. Newly formed cells in the meninges and dermis closely resembled young fibroblasts. In the nervous system neurovirus produced lesions in the meninges, the vascular adventitial sheaths, the subpial glia, the ependyma and the choroid plexuses. On occasion meningitis was found to be most severe over the lower segments of the cord and this lesion along with softening of the cord appeared to be responsible for the development of paralysis which was noted in a proportion of cases.

Observations are made on the relationship that exists between the four members of the group of viruses (classical myxoma virus, the variant of this produced by serial intracerebral passage – neuromyxoma virus, the tumour-producing strain of fibroma virus and the mutant inflammatory strain of fibroma virus). In the

early stages all four produce a generalized infection, but the fibromas in question differ from the myxoma in that they show no apparent tendency to invade the central nervous system. The morbid conditions produced by the different members are dissimilar clinically and pathologically and possible relationship was looked for by carrying out immunity tests. Rabbits infected with fibroma virus rapidly develop a partial refractory state to myxoma virus and rabbits infected with neuromyxoma virus become refractory to fibroma virus in about four days.

The observation of BERRY and DEDRICK, that inoculation of rabbits with a mixture of Shope fibroma virus (but not other viruses) and heat-inactivated myxoma virus results in myxomatosis capable of being transferred in series, was confirmed.

C. SHOPE found that multiple intraperitoneal or intravenous injections of either infectious or non-infectious rabbit papilloma suspensions immunized domestic and cottontail rabbits to papillomatosis. Both types of suspension stimulated the production of specific virus-neutralizing antibody. The capacity of the non-infectious suspensions to immunize is considered as evidence that they contain papilloma virus even though none could be demonstrated by infection tests.
—D. R. WILSON.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

SUGIMOTO, M. (1936). **On the Ixodidae of Formosa.**—*Bull. Res. Inst. Formosa.* No. 124. pp. 11. [In Japanese]. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 80].

A list is given of the Ixodids of Formosa, with descriptions of *Haemaphysalis cornigera* var. *taiwana*, n., from buffaloes, and *Ixodes taiwanensis*, sp.n., from dogs.

RASTEGAEVA, E. F. (1935). Opiti perenosa spirochetoza kur pri pomośći kleśćej *Dermanyssus gallinae.* [**Attempts to Transmit Fowl Spirochaetosis by** *D. g.*].—*Sborn. Rab. Leningrad. vet. Inst. 1935.* pp. 131-137. 2 figs. [Num. refs.]

By a series of tests on individual fowls it was found that *Argas persicus*, but not *D.g.*, was capable of transmitting *Spirochaeta gallinarum* among fowls.

SUGIMOTO, M. (1936). **On the Formosan Chicken Mite,** *Neoschöngastia gallinarum* **(Hatori 1920). I.**—*J. Soc. trop. Agric.* **8.** 241-252. 1 plate. [In Japanese]. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 80].

A description is given of *Trombicula* (*Neoschöngastia*) *gallinarum*, Hatori, which is widely distributed in Formosa, occurring on fowls and various wild birds, including sparrows. Fowls are usually infested under the wings and young ones are sometimes killed. A list is given of the other mites that are known to attack fowls in various parts of the world.

SYMES, C. B., & MCMAHON, J. P. (1937). **The Food of Tsetse-Flies** (*Glossina swynnertoni* **and** *G. palpalis*) **as Determined by the Precipitin Test.**—*Bull. ent. Res.* **28.** 31-42. 3 tables. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 160].

A detailed account is given of experiments in which the stomach contents of examples of *Glossina swynnertoni*, Aust., from a district of Tanganyika and of *G. palpalis*, R.-D., from Maboko Island, Kenya, were subjected to precipitin tests to determine the food preferences of these flies. The results, although mostly incon-

clusive, have perhaps narrowed the field of enquiry sufficiently to warrant a continuation of the work along more well-defined lines. Tests with a large number of examples of *G. swynnertoni* against numerous antisera suggested that the main hosts of this fly were one or more Bovids, exhibiting a close blood relationship to ox or buffalo, giraffe and pig. There is evidence that the fly also feeds on monkey or baboon, but not on zebra. The large number of examples of *G. palpalis* from Maboko Island, Kenya, were tested only against crocodile and hippopotamus antisera ; the results indicate that these hosts are far less important than was previously supposed and that most of the flies had fed on some other animal.

Potts, W. H. (1937). **The Distribution of Tsetse-Flies in Tanganyika Territory.** —*Bull. ent. Res.* **28.** 129-148. 1 map. [Numerous refs.] [Copied *verbatim* from *Rev. appl. Ent.* **25.** 161].

Details are given on the distribution of the eight species of *Glossina* that occur in Tanganyika Territory, namely, *G. brevipalpis*, Newst., *G. longipennis*, Corti, *G. fuscipleuris*, Aust., *G. palpalpis*, R.-D., *G. morsitans*, Westw., *G. swynnertoni*, Aust., *G. pallidipes*, Aust., and *G. austeni*, Newst. The fly belts, which are shown on a map, are described, and the natural features that affect the distribution of the fly and the possible extensions that the fly belts may undergo are discussed. Brief notes are given on the habits and habitats of the less known species, *G. longipennis*, *G. fuscipleuris* and *G. austeni*.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

Grieder, H. (1937). In der Schweiz selten Vorkommende Helminthen als pathogene Wirbeltierparasiten. [**Rare Helminth Parasites of Vertebrates in Switzerland.** *Pseudamphistomum truncatum* **in a Silver Fox**].—*Z. Parasitenk.* **9.** 145-150. 9 figs. [6 refs.]

G. describes *Pseudamphistomum truncatum* in the bile ducts of a silver fox as causing a hepatitis which led to the death of the animal.—E. L. Taylor.

Fraser, A. H. H., & Robertson, D. (1937). **On the Incidence of Abomasal Parasites in Fat Lambs from the Same Flock.**—*J. Helminth.* **15.** 53-60. 4 tables. [7 refs.]

F. and R. have added one more account to the several others previously published by other observers on the number of trichostrongylid worms which may occur in healthy lambs ; they found as many as 2,100 *Haemonchus contortus* and 4,670 *Ostertagia spp.* Although there was practically no difference between the infestation of single and twin lambs in May, August and September, the infestation of the four single lambs and eleven twins killed in July showed a considerable difference which the authors regard as " extremely suggestive."—E. L. Taylor.

Walker, T. (1937). **A Preliminary Report on the Helminthic Parasites of Poultry, Wild Birds and Small Mammals in the South Wales Area.**—*Vet. J.* **93.** 28-31. [12 refs.]

W. has carried out a number of *post-mortem* examinations of wild and domestic birds and reports his observations in this paper out of which the following may be mentioned. *Heterakis gallinae* was found to be most numerous during the winter and spring months in both the domestic fowl and the pheasant. An infestation of 123 *Davainea proglottina* was thought to be pathogenic for poultry.

[Taylor failed to find pathogenic effects from infestations as high as 2,900]. *Hymenolepis nana* was found in a brown rat.—E. L. Taylor.

Cameron, T. W. M. (1936). **Studies on the Endoparasitic Fauna of Trinidad Mammals. IV. Further Parasites from Trinidad Deer.**—*Canad. J. Res.* Sect. D. **14.** 165-167. 1 fig. [5 refs.]

C. records *Paramphistomum cotylophoron* from *Mazama simplicicornus*, noting that it appears to be an African parasite which has been introduced into America. He also describes the female of *Eucyathostomum longesubulatum*, the male of which was described in an earlier paper.

Clapham, Phyllis A. (1937). **On some Lesions Associated with Helminths in Birds of Economic Importance.**—*J. Helminth.* **15.** 49-52. [6 refs.]

This paper deals with some pathological conditions which the author has come across in birds, and which were considered to be the result of helminth infestation. They are as follows: severe enteritis in the first part of the small intestine of a guinea fowl resulting from a massive infestation with thousands of *Ascaridia* larvae. Severe enteritis in four partridges resulting from a heavy infestation with *Capillaria longicollis*; in every instance the intestinal wall had become very thin, and, in one, had actually ruptured. The nodular formation in the wall of the caecum, resulting from infestation with *Heterakis isolonche*, has been noticed in partridges as well as in pheasants; *Davainea proglottina* has been found associated with enteritis and haemorrhage in partridges and chickens and in these infestations the number of scolices has been found to reach " many hundreds ".—E. L. Taylor.

Basnuevo, J., & Anido, V. (1937). Manera de conservar huevos de helmintos. [**Preservation of Helminth Ova**].—*Med. Hoy., Habana.* **2.** 300. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 794. Signed H. H. S.]

The authors recommend the addition of 25 c.c. of the following to 100 gm. of faeces: formol 15 c.c., glycerin 20 c.c., water 100 c.c. If the faeces are not liquid or pasty 25 c.c. distilled water should be added to homogenize them. If the eggs are scarce, he suggests addition of 100 c.c. of water and passage through a fine-meshed sieve, collection of residue in centrifuge tubes, running down vigorously, pouring off the supernatant fluid and adding to the residue an equal amount of the formol-glycerin solution. They will thus be preserved, indefinitely. The process is good also, they state, for preservation of protozoal cysts.

Vassilkova, Z. (1936). Sur la déshelminthisation des eaux d'égout épurées par methodes intenses. [**Helminthic Ova in Sewage Works**].—*Med. Parasitol., Moscow.* **5.** 657-674. 3 figs. [16 refs.] [In Russian: French summary]. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 794. Signed H. H. S.]

Examination of the sewage effluent at the Toula works and of the sludge there and at Kojoukhov (Moscow) showed the presence of ova of ascaris, trichuris, enterobius, diphyllobothrium and taenia, up to nearly 2,000 per litre. In the Imhoff tank nearly all were removed (97 per cent.), in a second sedimentation reservoir 87 per cent.; biological filtration reduced the total by 18-26 per cent. only. Chlorine methods of purification did not affect the vitality of the ova. The sludge contained 466 ova per gram, the same five species being found; methane fermentation reduced this number by about a fifth. They might remain alive up to 2 years in sludge kept in the open. Methods suggested by the author for getting rid of or destroying them include sand filtration, raising the temperature in the methane reservoirs to 45° C., prolonging the sedimentation time and others.

Scott, J. A. (1937). **The Effect of Various Solutions on Helminth Eggs in Feces.**—*J. Parasit.* **23.** 109-112. 3 tables.

S. made a few observations on the slow rate of disappearance of *Ancylostoma*, *Ascaris*, and *Schistosome* eggs from faeces in distilled water, N/10 caustic soda or 2% chlorine solution. In each case 1 part of faeces was mixed with 14 parts of the solution and the decrease in the number of eggs found to be practically negligible after six weeks. The method is therefore quite suitable for the transit of living eggs by post.—E. L. Taylor.

Wager, V. A. (1937). **Bilharzia Disease. The Destruction of Carriers.**—*Emg S. Afr.* **12.** 104. 2 figs. [3 refs.]

W. records the toxicity for the cercariae of the bilharzia parasite of the fruits of a tree *Balanites maughami* growing in the low veldt. One fruit in 50 gallons of water proved fatal to the snails in 24 hours and even weaker solutions killed the cercariae. Small fish and tadpoles were killed as well, but mosquito larvae were not affected. The use of the fruits for controlling bilharzia infection in water supplies was not considered to be practicable owing to a possible upsetting of the balance of nature.—E. M. Robinson.

Price, E. W. (1937). **A Note of the Occurrence of a Trematode of the Genus Clinostomum in a Chicken.**—*N. Amer. Vet.* **18.** No. 4. 33-36. 1 fig. [8 refs.]

P. gives an account of the occurrence of a trematode, provisionally identified with *C. attenuatum*, in the trachea of a fowl and gives a figure and a description of the parasite. An immature specimen of this species had previously been reported as found in the intestine of a pigeon in this same locality (Nebraska). The metacercariae of *C. attenuatum* from the American bittern are known to occur in frogs and it is suggested that the chicken became infected by eating a frog.—E. L. Taylor.

Vogel, H. (1937). Beobachtungen über die Lebensgeschichte von *Opisthorchis felineus* in Ostpreussen. [**Life-History of** *Opisthorchis felineus* **in East Prussia**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 250-254. 22 figs. [9 refs.]

V. has followed up the previous laboratory investigation in which *Bithynia leachi* was found to be the only suitable intermediate host snail, out of 15 suspected species, by a survey carried out in two districts where *Opisthorchis* infestation is endemic; of 723 *B. leachi* examined in one part, 2 were found to be infected, and of 231 examined in another district 4 were found to be infected.

Cats are considered to play a most important role as reservoir hosts for human infection, the infection of snails usually coming from that source.—E. L. Taylor.

Freeman, A. E., Jr., & Ackert, J. E. (1937). *Metorchis albidus*, **a Dog Fluke New to North America.**—*Trans. Amer. micr. Soc.* **56.** 113-115. 1 fig. [5 refs.]

F. and A. describe a case of carcinoma in the liver of a husky dog, associated with a heavy infestation with *M.a.* It is the first time that these flukes have been reported from North America and a description of the specimens is given. Although they are twice as large as those which have been described from Europe, they are considered to belong to the same species.—E. L. Taylor.

I. Penfold, W. J., Penfold, H. B., & Phillips, Mary. (1937). *Taenia saginata*: **Its Growth and Propagation.**—*J. Helminth.* **15.** 41-48. 1 table. [3 refs.]

II. Penfold, W. J., & Penfold, H. B. (1937). *Cysticercosis bovis* **and its Prevention.**—*Ibid.* 37-40.

III. Schapiro, M. M. (1937). **A Quantitative Study of Egg Production in** *Taenia saginata.*—*J. Parasit.* **23.** 104-105. 1 table.

I. This paper briefly records a large number of observations on *T.s.* in the human host. Many interesting points are mentioned from which the following are cited as of particular interest. The length of the adult worms ranges between 9 and 20 feet, the rate of growth is between 8 and 9 segments per day, the worm reaching maturity in 84 days. The number of segments in a mature worm varies between 800 and 900 and worms have been observed to live for as long as 35 years. The number of eggs in a segment varies from 5,000 to 130,000 and averages 80,000 and one worm produces 720,000 eggs daily.

II. Cattle on sewage farms in Australia are frequently found to be infested with *Cysticercus bovis* and as a precautionary measure, to prevent human infestation, the keeping of cattle on these farms has been prohibited. The authors' work has shown, however, that the immunization of cattle against this infestation is a simple matter as the cysticerci in a heavily infested ox all die within nine months of the date of infestation and this immunity can readily be produced by giving a dose of some 400,000 living eggs of the tapeworm from man.

A brief account is given of some experiments which demonstrated this point.

III. S. estimated the number of eggs in four separate segments of *T.s.* and found the average content to be 123,810 eggs. Using available data on the rate of growth and longevity of the worm he calculates that during a month 49,524,000 eggs are produced by one worm, and during the span of life of 18 years one worm may produce 10,698,184,000 eggs.—E. L. Taylor.

Davey, D. G. (1937). **Attachment of the Sheep Hookworm to the Common Sheep Tapeworm.**—*Nature, Lond.* **139.** 250. 1 fig. [1 ref.]

D. twice observed *Bunostomum trigonocephalum* attached by the buccal capsule to *Moniezia* freshly taken from the intestine of a sheep. A photomicrograph which accompanies this note shows one of these attachments: the tissue of the cestode is drawn into the nematode's mouth capsule and appears to have undergone some digestive change.—E. L. Taylor.

I. Foster, A. O. (1936). **On a Probable Relationship between Anemia and Susceptibility to Hookworm Infection.**—*Amer. J. Hyg.* **24.** 109-128. 4 tables, 2 graphs. [15 refs.]

II. Kerr, K. B. (1936). **Studies on Acquired Immunity to the Dog Hookworm,** *Ancylostoma caninum.*—*Ibid.* 381-406. 16 figs. on 4 plates, 2 tables. [Numerous refs.]

I. When dogs were rendered anaemic by repeated bleeding, or by feeding exclusively on milk, their susceptibility to infestation by *A.c.* was increased. This was shown by observation on the survival of ingested larvae, and on the rate of egg production by adult worms. On recovering from the anaemia, they regained their normal resistance.

II. The subcutaneous or oral administration to mice, of a series of sublethal doses of living larvae of *A.c.*, was followed by increased resistance to a subsequent gross infestation. The lethal effect of the larvae on the control animals was due to damage to the lung capillaries. In treated mice, a smaller proportion of larvae escaped the defensive mechanisms in the gastric and oesophageal walls. The higher larval death rate coincided with increased local cellular reactions in which neutrophiles, macrophages, fibroblasts and giant cells (but not eosinophiles) played an important part.—E. W. Ascoli.

Lossev, L. (1934). Materiali po degelmintizacii vnešnej sredy pri ascaridoze. [**Destruction of Ascaris Eggs in Stables and Kennels**].—*Med. Parasitol., Moscow.* **3.** 185-191.

In the course of about 130 experiments L. found that temperatures of 60°, 70°, 80°, 90° and 100°C. brought about cessation of the growth of ascarid eggs. 80°C. for 10 seconds destroyed all ascarid larvae. Unslaked chloride of lime scattered on the infected material and covered with water and a 4% solution of phenol killed the eggs of *Parascaris equorum* and *Toxocara canis* instantaneously.

Rafael Colmenares, C. (1935). Conjuntivitis verminosa. [**Verminous Conjunctivitis in Fowls**].—*Rev. med. vet., Bogotá.* **6.** 50-52.

The causal worm, *Oxyspirura mansoni*, is found below the membrana nictitans of both domestic and wild fowl.

Clinical symptoms are :– anaemia and progressive emaciation, photophobia, inflammation of the conjunctiva and persistent lachrymation. Young birds are the chief sufferers, especially turkeys. The male parasites average 6 mm. and the females 15 mm. and it is difficult to find them in the conjunctival sac as they move with great rapidity into the lachrymal ducts on exposure to light.

The evolution of the parasite is by an intermediate host. The excreted eggs are ingested by cockroaches, and these are in turn ingested by the fowls.

Injection of 10% " argyrol " after taking out the parasites is effective. The injection of a 2% creolin solution once daily for four days kills the parasites, when they cannot be extracted.—W. L. Marshall.

Sanchez, E. L. (1936). Contribución al estudio de la bronquitis verminosa del cerdo. [**Verminous Bronchitis of Swine**].—*Rev. Hig. Sanid. pecuar.* **26.** 8-12.

It has never been possible to transmit *Strongylus paradoxus* from one pig to another by the ingestion of worms or infected material from other infected animals.

Infestation has, however, been produced by ingestion of infected material from the fields. The eggs, after passing out in the dung or *via* the mouth, are eaten by certain snails which are in turn eaten by the pigs.

The action of the worms in the lungs is mechanical, the symptoms of infestation being trembling, grinding of the teeth, and persistent fits of coughing.

Curative treatment is unsatisfactory. Prophylactic measures consist of dividing the infected pastures into three parts and confining the pigs to one part each year. Considerable mortality is also caused in sheep by this worm.—W. L. M.

Garrigues. (1936). Sur quelques cas d'ophthalmie vermineuse du cheval, au Tonkin. [**Verminous Ophthalmia of Horses at Tonkin, Indochina, (Setaria)**]. —*Rev. vét. milit.* **20.** 413-422. 2 figs.

G. gives his experience of four cases. The symptoms and the routine operation for the condition are described at length, particularly pre- and post-operative details. Some inconclusive evidence is produced to show that absorption of the parasite may occur naturally if operative intervention is delayed. He discusses the uncertainty existing in regard to the exact species of *Setaria* involved in this condition. The parasites which he obtained from his own cases do not appear to have been submitted for identification.—C. Davenport.

Wehr, E. E. (1937). **Macroscopic Differentiation of Species. Relative Abundance of Crop Worms in Turkeys.**—*Vet. Med.* **32.** 230-233. 3 plates.

W. made an examination of a large number of oesophagi from turkeys and

found infestation with *Capillaria contorta*, *C. annulata* and *Gongylonema sp.* to be very prevalent. The crop was found to be the predilection seat but where worms were particularly abundant they were found in almost any part of the oesophagus.

He points out that the specific identity of the parasite may be ascertained by a naked-eye observation of the shape of the coils in which the worm lies in the mucous membrane ; *Gongylonema* lies in regular zigzag coils, the coils in *Capillaria* are uneven, and *C. contorta* is much larger than *C. annulata*. [Figs. 2 and 3, plate 1, the reference to which has been omitted, presumably refer to these two species].—E. L. Taylor.

IMMUNITY.

Boquet, A., & Sandor, G. (1936). Méthode de purification de la tuberculine (tuberculine phosphotungstique). [**Purification of Tuberculin by Phosphotungstic Acid**].—*Ann. Inst. Pasteur.* **57.** 622-630. 2 tables. [See also *V. B.* **6.** 661 and **7.** 388].

B. and S. state that the tuberculin activity of protein substances precipitated from synthetic medium tuberculin by such agents as trichloracetic acid or ammonium sulphate are most inconstant and from this they deduce that the active principle is not necessarily a protein, but some product the chemical nature of which is at present unknown.

They claim to have obtained a highly active preparation with regularity by precipitation with phosphotungstic acid. Unheated filtered cultures are treated with phosphotungstic acid and sulphuric acid, and the precipitate produced is washed with acid. This precipitate is then taken up with sufficient baryta water to make the suspension just green to brom-thymol blue. The insoluble material is removed by centrifugation and the supernatant, which contains the active principle, is removed. Further purification can be attained by treating the product with acidified methyl alcohol. The active principle is brought down completely with the precipitate and can be redissolved in N/100 NaOH.

The chemical composition of this purified tuberculin is given. In regard to activity, 1 mg. contained about 100,000 skin reacting doses for the g. pig.—R. E. G.

Sá Viana Conte, H., & Belo, M. M. A. (1936). A intradermo-reacção no diagnóstico da tuberculose bovina. [**The Intradermal Tuberculin Tests**]. —*Rev. Med. vet., Lisboa.* **31.** 48-61. 3 figs., 2 tables, 2 charts.

This test has given much better results in Portugal when performed in the neck than in the caudal fold, the increase in measurement varying from 0·5-1 mm. in the caudal fold to 2·5-5 mm. in the neck. In only 5 out of 50 reacting animals were clearer reactions noted in the caudal fold.

The increase in the measurement varied from 2·3 mm. (minimum) to 38·5 mm. (maximum).—W. L. Marshall.

Beijers, J. H. (1936). De tuberculinaties en haar beoordeeling. [**Tuberculin Tests in Cattle**].—*Tijdschr. Diergeneesk.* **63.** 1269-1279. [English, French and German summaries].

B. discusses the difficulty in reading the ophthalmic tuberculin reaction in cattle, but emphasizes, that such difficulties are also met with when using the intradermal test as advocated by American investigators. Animals which have been frequently tuberculin-tested as well as those which have recently been transported, should be excluded from the application of the ophthalmic test ; it is

advisable to submit them simultaneously to both the ophthalmic and double intradermal tests and also to check the temperature every two hours after the first injection.—M. J. J. Houthuis (Rotterdam).

Craig, J. F., & Davies, G. O. (1937). **Intradermal Avian Tuberculin Test in Ducks.**—*Vet. Rec.* **49.** 29-30.

The intradermal test using a synthetic medium tuberculin was applied to a flock of 15 ducks. The injections in doses of 0·1 c.c. were made in the web and the readings taken at the 48th hour. Any appreciable thickening was regarded as a positive reaction.

The results were disappointing since only 4 ducks out of 13, which showed definite lesions at autopsy, reacted, while one reactor was free from visible lesions. —R. E. Glover.

Michelazzi, L. (1936). L'allergia tubercolare aspecifica. **[Non-Specific Tuberculous Allergy].**—*G. Batt. Immun.* **16.** 439-448. 3 figs. [9 refs.] [English, French and German summaries].

M. considers that the cutaneous hypersensitivity of the tuberculous rabbit is manifested towards many bacteria, including *Bact. coli*. This sensitivity towards *Bact. coli* will, however, fail if the tuberculous rabbit is immunized against the organism. Heating to 100°C. or treatment with formaldehyde will not perceptibly alter the hypersensitizing capacity of *Bact. coli*.

The isolated intestine and bronchial apparatus of tuberculous rabbits or g. pigs do not show any sensitivity to *Bact. coli*.

The serum of tuberculous rabbits will fix the complement in the presence of certain bacteria.—Norman Bisset.

Blampied, T. le Q., & Mackay, A. A. (1937). **The Double Intradermal Test (Holtum's Technique) as an Additional Aid in the Diagnosis of Contagious Abortion.**—*Vet. J.* **93.** 178-188. 7 tables.

The authors compared the value of a double intradermal test with the agglutination test for the diagnosis of contagious abortion in 162 animals belonging to 11 herds. The intradermal antigen was made from agar cultures of a *Br. abortus* strain, and a suspension of an opacity corresponding to Brown tube 10 was made. The injection was made in the neck using 0·2 c.c. of suspension and this was repeated 48 hours later. The results are presented in the form of tables and it is seen that there is close agreement between the tests. In a few instances the intradermal test was positive in animals whose blood serum contained antibodies at a later date. [The authors do not state whether the dose of *Br. abortus* suspension used for the intradermal test of itself produced antibodies in the blood].—S. J. E.

Lacorte, G. J. (1937). A sôro-aglutinação no diagnostico das bruceloses. **[Serum Agglutination in the Diagnosis of Brucella Infections].**—*Hosp., Rio de J.* **11.** 205-209. [10 refs.] [English summary]. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 461. Signed G. S. Wilson].

The author has examined 2,331 samples of human serum collected from various parts of Brazil for the presence of agglutinins to *Br. melitensis*, *Br. abortus*, and *Br. suis*. The suspensions were prepared from 48-hour liver agar cultures at 37°C., and the organisms are said to have been killed with 5 per cent. formol. In the test itself the tubes were incubated for 3-4 hours at 55°C., and left in the ice-chest overnight. Only five of the sera reacted to as high a titre as 1/50; of these, four agglutinated *Br. melitensis* only, and one agglutinated all three suspen-

sions. The author concludes that brucella infection in man must have been introduced quite recently into Brazil, and that it is at present sparsely distributed. [These figures support the conclusion that normal agglutinins to Brucella in a non-infected population are rarely found in a titre as high as 1/50.]

Stover, D. E. (1937). **A Spot Method of Conducting Whole-Blood Agglutination Tests with Stained Antigen.**—*N. Amer. Vet.* **18.** No. 1. 17-20. 1 fig. [4 refs.]

A dense, coloured antigen containing potassium oxalate is mixed with a drop of blood in a narrow tube, and deposited on to blotting paper. Negative samples have a blot of even opacity but positive samples show a darkly stained centre surrounded by a compact ring of blood cells. *Brucella abortus* and *Salmonella pullorum* antigens have been used.—H. H. Holman.

Donatien, A., & Lestoquard, F. (1936). Le diagnostic de la peste porcine par intradermo-réaction. [**An Intradermal Test for Swine Fever**].—*Rev. vét., Toulouse.* **88.** 657-668. [10 refs.]

This test is carried out on immune animals and is dependent on the presence of the specific antigen (swine fever virus) in the blood or bone-marrow taken from the suspected animal. A positive result is obtained only with an antigen (equal parts of blood from the suspected animal and castor oil) which contains swine fever virus and only when the test animal is hyperimmune or has recently acquired an active or passive immunity. Passively immunized animals are suitable test subjects for a period of about one week following injection. The antigen is inoculated in a dose of 0·5 c.c. (subcut.) into the internal face of the thigh and a positive reaction is indicated after 24 hours by a diffuse oedematous and erythematous swelling, the dimensions of which are appreciably greater than the initial one.—D. R. Wilson.

Mesrobeanu, Lydia. (1936). Les antigènes glucido-lipidiques des bactéries. (Étude chimique et biologique). [**Glycolipid Antigens**].—*Arch. roum. Path. exp. Microbiol.* **9.** 1-120. 3 figs., 32 tables. [Numerous refs.]

M. has been collaborating with Boivin and others in an investigation of the antigenic structure of various bacteria [*V. B.* **6.** 699, and **7.** 9, 187 and 288]. This is a summary of their work and it includes a review of the literature and a description of technique. By treatment with trichloracetic acid and centrifugation, a complex substance termed " complete antigen " is isolated. It is further purified by dialysis, the " complete antigen " being non-dialysable. It can be desiccated to a solid substance which forms an opalescent solution in water. In structure it is thought to be a rather fragile complex of a polysaccharide nucleus and various organic acids (acetic acid, phosphoric acid and fatty acids). Heating in weak acid solution causes cleavage of the polysaccharide nucleus from the organic acids. With certain bacteria, especially those which autolyse, this cleavage may occur in cultures. Whereas " complete antigen " is specifically antigenic and toxic, the polysaccharide is non-antigenic and non-toxic, but reacts *in vitro* in a specific manner with homologous antibody. " Complete antigen " is generally absent in rough cultures but there is not a constant correlation in this respect. M. and her co-workers regard " complete antigen " as representing the hypothetical " O " antigen of earlier workers and also " endotoxin ". Its toxicity varies in different strains but is much greater in pathogenic than in non-pathogenic strains. " Complete antigen " has been demonstrated in many species, *Salmonella typhi*, *S. paratyphi* A, B and C, *S. typhi-murium* (*aertrycke*), *S. enteritidis* (Gärtner), *Bact. coli*,

dysentery bacilli, *Proteus*, cholera vibrios, *Pseudomonas pyocyanea*, *Chromobact. prodigiosum* and *Bact. tumefaciens*. On application of the same technique to certain other bacteria, *e.g.* pneumococci and tubercle bacilli, only free specific polysaccharide is recovered. M. suggests that these bacteria (1) may not contain glycolipid antigens, or (2) may have insoluble compounds, or (3) may contain an extremely fragile complex which breaks up during the extraction process.—C. McGAUGHEY.

I. TOPLEY, W. W. C., RAISTRICK, H., WILSON, J., STACEY, M., CHALLINOR, S. W., & CLARK, R. O. J. (1937). **The Immunising Potency of Antigenic Components Isolated from Different Strains of** *Bact. typhosum*.—*Lancet*. **232.** 252-256. 5 tables. [Numerous refs.]

II. STAMP, T. C., & HENDRY, E. B. (1937). **The Immunising Activity of Certain Chemical Fractions Isolated from Haemolytic Streptococci.**—*Ibid.* 257-259. 2 figs., 2 tables. [6 refs.]

III. ANON. (1937). **The Immunising Antigens of Bacteria.**—*Ibid.* 274-275. [3 refs.]

I. T. and his co-workers found that whole cultures of a Vi strain of *Salmonella typhi* killed by formol and heating at 55°C. are more effective in immunizing mice than are whole cultures of an O strain. The superiority of the former strain is most evident when the injections are made subcut. and not more than two in number. Using the technique employed in earlier work on *S. typhi-murium* [see *V. B.* **4.** 762.] they have isolated purified antigens of the F68 type with which they have obtained results exactly parallel to those obtained with killed whole cultures. Chemical analysis has shown that the antigen derived from a Vi strain differs in chemical characters from that isolated from an O strain.

II. S. and H. using dilute acids and alkalis have isolated from a streptococcus of bovine mastitis origin and belonging to Lancefield's Group C, a protein fraction capable of immunizing mice. This fraction is comparatively stable and not inactivated by ammonia. From a Group A streptococcus of human origin, they have isolated a protein fraction also capable of immunizing but susceptible to the action of ammonia and not so stable.

III. This is a brief review of the work of FELIX on Vi antigens, of TOPLEY and RAISTRICK on the immunising fractions of *S. typhi-murium* and *Bact. typhi* and of STAMP and HENDRY on streptococci.—C. McGAUGHEY.

SOKHEY, S. S., & MAURICE, H. (1937). Sur les pouvoirs protecteurs relatifs de vaccins antipesteux préparés les uns au moyen de cultures tuées par la chaleur, les autres au moyen de cultures vivantes avirulentes. **[Protective Power of Heat-Killed Virulent and Living Avirulent Plague Vaccines].**—*Bull. Off. int. Hyg. publ.* **29.** 505-513. [2 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 790. Signed W. F. H.]

Measurement of protective power and of virulence is attainable by using a dose of which the content in bacilli is known and by using the white mouse as the testing animal because it is susceptible and gives a constant reaction. One of the objects of the research work here described was to measure the relative immunizing power of killed virulent bacilli and living but avirulent bacilli. A most important point in this comparison was that the same strain of organism was used for both these tests. The organism was rendered avirulent without loss of antigenic power by culture at 37·5°C. on agar for about 60 to 70 weeks with weekly subculture or by growing it continuously for 10 weeks in nutrient bouillon at the same temperature. Thus, for example, an original culture, which killed 5 mice out of 5 by subcutaneous injection of only 12 bacilli, failed to kill any mice by the 64th sub-

culture even in subcutaneous dose of 64,000,000 bacilli. An experiment which made comparison of the protective value of the two types of the same strain of organism gave the minimum protecting dose against the standard infecting dose as 0·002 c.c. for the vaccine killed by heat and 0·3 c.c. for the avirulent living vaccine. These protective results are obtainable not in mice only but in guineapigs and rats also. The reason why previous workers have been unable to get immunization of these susceptible animals with killed cultures is that they have used too high a temperature for too long a time for the purpose of killing. The authors kill their cultures by heating for 15 minutes at 55°C. The value of this low temperature and short time is brought out by an experiment showing how the minimum protective dose for mice with a culture thus killed was 0·002 c.c., whereas for a culture killed by heating one hour at 60°C. it was 1·5 c.c. Killing with 0·5 per cent. phenol without heat is as good as heating for 15 minutes at 55°C., and more efficacious than if the killing is done with formol.

DE VOGEL, W. (1937). La vaccination antipesteuse à Java. (Indes Néerlandaises) avec un virus vivant. Quelques résultats enregistrés jusqu'au 11 juillet 1936. [**Antiplague Vaccination with Living Organisms**].—*Bull. Off. int. Hyg. publ.* **29.** 514-527. 1 table, 5 diagrams. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 791. Signed W. F. H.]

The work of OTTEN in Java merits close attention because it is conducted on lines which endeavour to make comparison of the vaccinated and non-vaccinated under strictly comparable conditions of age and sex distribution, with the employment of an alternative case method of selection. So far as they go, the figures are very favourable to the use of living vaccine. A total of 37,435 vaccinated with mortality of 1·01 per thousand is set over against the total of 39,483 non-vaccinated with mortality of 5·05 per thousand. A five-fold reduction of mortality is evident here and OTTEN hopes to make the reduction a ten-fold one.

ZERNOFF, V. (1937). Le rôle du système nerveux dans l'immunité. [**Role of the Nervous System in Immunity**].—*Ann. Inst. Pasteur.* **58.** 212-231. 11 figs. [Numerous refs.]

A preliminary survey is given of recent contributions to the study of the experimental production of conditioned reflexes.

Z. studied the effect of external stimuli on haemolysin production in g. pigs and rabbits. Fifteen g. pigs received a series of injections (subcut. and intraperit.) of sheep's red blood corpuscles, each injection being preceded by scratching the ear of the animal. From 14 to 60 injections of the antigen were required to produce the conditioned reflex of haemolysin production. The haemolytic titre of the blood serum was estimated after the injection of the antigen; this was found to have increased in six animals. After an interval of 20 to 40 days without the application of the stimulus, a further blood test revealed an increase of haemolysin in two g. pigs. A repetition of the stimulus was again applied daily for three to ten days, without the inoculation of the antigen, and two g. pigs showed a reflex increase in the haemolytic titre.

Five control g. pigs showed no increase in haemolysin after the second blood test.—E. C. HULSE.

HAUROWITZ, F. (1937). Antigene, Antikörper und Immunität. Versuche mit chemisch-markierten Antigenen. [**Antigens, Antibodies and Immunity. Experiments with Synthetic Antigens**].—*Klin. Wschr.* **16.** 257-261.

3 tables. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12**. 393-394. Signed W. W. C. Topley].

In this interesting paper, the author summarizes the experimental results that he has obtained during recent years, alone, or in collaboration with Breinl and others, and adds some new observations. Reviewing these findings, and those of many other workers, he draws certain tentative conclusions with regard to the mechanism of antigen-antibody reactions, and of antibody formation.

The systems that he has studied have consisted of synthetic antigens prepared by linking arsenical compounds to different serum globulins by means of the diazo reaction, and the antisera produced by the injection of these antigens into rabbits. Precipitin reactions carried out before and after the absorption of these antisera with different antigens have given results indicating that at least three different antibodies are produced in response to the injection of a single synthetic antigen, (1) an antibody reacting with the arsenical groups linked to the globulin molecule, (2) an antibody reacting with the globulin of the antigen, and (3) an antibody the specific union of which depends both on the arsenical group and on the nature of the globulin to which it is linked.

A large part of the paper is devoted to the consideration of quantitative data derived from experiments with systems so selected that antigen-antibody union depends on the arsenical group alone. In such systems it is possible, by quantitative determinations of the arsenic content, to estimate the number of specific reactive groups attached to a single molecule of antigen. On the basis of the results obtained, the author concludes that, under these particular conditions, one molecule of antibody combines with a single specific group on the antigenic molecule. With certain exceptions, *in vitro* precipitation does not occur unless the antigenic molecule contains at least ten specific reactive groups ; but the *in vivo* production of antibodies is stimulated by the injection of an antigen containing a single specific reactive group per molecule. This conclusion is, as the author emphasizes, of considerable theoretical importance, since it would seem to indicate that, in this system at least, the antigen-antibody reaction depends on the nature of the isolated specific antigenic grouping, not on the arrangement on the complex antigenic molecule of multiple specific reactive groups.

The author then reviews the evidence in relation to the theory of antibody-production which he advanced six years ago in collaboration with Breinl, and which was independently suggested by Mudd a little later. According to this view, antibodies are serum globulins that have been synthesized from amino-acids and simple peptides in immediate contact with a molecule, or molecules, of antigen bearing the specific reactive groups. They are, therefore, marked with the impress of the antigenic molecule, with which, during their formation, they have been combined. The author would tentatively locate this synthesis in the reticulo-endothelial cells, and would regard the antigen as being adsorbed to some active intracellular interface concerned in protein syntheses. So long as the antigenic molecule remained in this position, the globulin synthesized at the modified interface would bear the stamp of a specific antibody. The author admits that there is, as yet, no decisive experimental evidence in favour of this view. Such evidence must, indeed, await an advance in our knowledge of the mechanism of the synthesis of the serum proteins. He considers, however, that this tentative hypothesis is compatible with all the known experimental facts, and that it would serve to explain certain immunological data that seem inexplicable on any other view.

It is noted that, in the particular system with which the author was working,

no evidence could be obtained that *in vitro* precipitation depended on the presence of lipoid constituents in the antigen, or in the antibody.

Newton, W., & Edwards, H. I. (1936). **Virus Studies. I. The Production of Antisera in Chickens by Inoculation with Potato X.**—*Canad. J. Res.* Sect. C. **14.** 412-414. 1 table.

Potato virus X contained in the sap of *Datura meteloides* and *D. stramonium* was inoculated into chickens for the production of antiserum. Two unknown viruses, one from tomato, the other from spinach, reacted against the antiserum produced. N. and E. believe that this establishes them as belonging to the same virus group.—T. W. M. Cameron.

I. Weichsel, M., & Salfeld, H. (1936). **Brain Antibodies in Men.**—*J. Immunol.* **31.** 421-428. [20 refs.]

II. Salfeld, H., & Weichsel, M. (1936). **Serologic Specificity of Lung Tissue.**—*Ibid.* 429-437. 4 tables. [7 refs.]

I. W. and S. using complement-fixation tests were unable to detect antibodies against brain tissue in the sera of persons who had been immunized against rabies. Similar tests of the sera of patients suffering from chronic encephalitis and undergoing treatment with herpes virus brain vaccine were also negative as were tests of the sera of six children who had been treated with antipoliomyelitis vaccine. The blood and spinal fluid of a child showing nervous symptoms following antirabic treatment were also negative.

II. S. and W. have shown by means of complement-fixation tests that ox lung contains an alcohol soluble haptene which is completely organ specific and almost completely species specific. Skin tests with alcoholic lung extracts on immunized rabbits and precipitin tests with the sera of such rabbits were negative.

—C. McGaughey.

Schneider, L., & Szathmáry, J. (1936). Az újszülött csikó humorális immunitásának eredete. [**Origin of Humoral Immunity of the New-Born Foal**].—*Állatorv. Lapok.* **59.** 265-270. 1 table, 3 charts. [Numerous refs.]

The authors draw attention to the fact that immunity in foals is not acquired *in utero*, but is obtained from the mare's milk after birth.

—Z. de Czukas (Magyaróvár).

Hughes, W. H. (1936). **The Alteration in the Bactericidal Power of the Blood in the Presence of Inflammation.**—*Brit. J. exp. Path.* **17.** 369-373. 5 tables. [3 refs.]

Using the slide-cell method and a strain of *Staphylococcus aureus* as test organism, H. shows that, whereas in normal blood the bactericidal power does not fall *in vitro* within six hours, in the blood of patients with bacterial infections there is a steady loss after withdrawal. This deterioration can be demonstrated also in normal persons at the stage of reaction after administration of a bacterial vaccine. The results of tests in which normal serum and corpuscles were substituted for patient's serum and corpuscles suggested that a toxic substance is present in the blood in bacterial disease and that this substance exerts an inhibitory effect on the bactericidal power of the corpuscles. This toxic substance can be titrated but its nature is unknown. It remains active for days in serum kept in the cold, but disappears rapidly from the blood when inflammation has subsided. The presence of the substance in the patient is not indicated by any of the usual routine tests except that generally it co-exists with a rise in temperature.—C. McG.

Jusatz, H. J. (1936). Der Einfluss der Vitamine auf den Immunitätszustand des tierischen Organismus. I. Mitteilung. Die fettlöslichen Vitamine A und D. II. Mitteilung. Wasserlösliche Vitamine. [**Influence of Vitamins on Immunity in Animals. I. Vitamins A and D. II. Water Soluble Vitamins**].—*Z. ImmunForsch.* **88.** 472-482 and 483-496.

J. has studied the influence of deficiency and excess of vitamin A, B, C and D, upon the ability of rabbits to respond to certain immunological stimuli. The criteria upon which responses were judged were the bactericidal power of blood and the production of precipitin. [Unfortunately it is difficult to assess quantitative variations in precipitin production since the "optimal ratio" technique was not adopted].

A diet deficient in the fat-soluble vitamins A and D diminished the ability of animals to produce antibodies and entirely eliminated any bactericidal action of their blood. The addition of some vitamin D (but not A) restored these functions, but excessive administration of vitamin once again had a depressant effect. Deficiency of water-soluble vitamin B had no apparent influence, whilst the part played by vitamin C was uncertain. The administration of injections of vitamin C, *e.g.* as ascorbic acid, produced a striking but transitory stimulating effect upon antibody production.

J. is of the opinion that the administration of an adequately balanced diet is far more important than the presence or absence of single constituents such as vitamins.—E. J. Pullinger.

Cotrufo, P. (1937). Influenza dell'acido ascorbico (vitamine C) sullo sviluppo dei processi immunitari in corso di immunizzazione specifica attiva. [**Influence of Vitamin C on Immunity**].—*G. Batt. Immun.* **18.** 291-304. 1 table. [Numerous refs.] [English, French and German summaries].

Two groups of rabbits were vaccinated with *Salmonella typhi*, one group being also injected (subcut.) with 25 mg. of vitamin C daily. On testing later, serum from the animals which had received vitamin C showed a much higher agglutination titre and possessed greater complement-fixation and phagocytic powers than serum from the animals which had received the vaccine alone.—J. A. Nicholson.

Salle, A. J., & McOmie, W. A. (1937). **Immunological Responses of Tissues Cultivated in vitro.**—*J. Immunol.* 32. 157-170. 3 tables. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 541. Signed W. W. C. Topley].

The authors record a series of observations in which they have endeavoured to demonstrate the formation of precipitins, agglutinins and haemolysins, following the addition of the appropriate antigens to actively growing tissue cultures. Their results were uniformly negative. Comparing these results with the positive findings recorded by several earlier workers, they note that the antibody titres reported have, in almost all instances, been very low, and are hence of doubtful significance. The results obtained in some of these earlier experiments, in which antigenic material was injected into an animal, and tissue cultures subsequently prepared from the spleen or other tissue, are not, as they emphasize, comparable with their own findings.

Taking the evidence as a whole, they consider that the formation of antibodies in tissue cultures has never yet been conclusively demonstrated.

DISEASES, GENERAL.

HULL, F. E., & DIMOCK, W. W. (1937). **Sheep Diseases.**—*J. Amer. vet. med. Ass.* **90.** 469-478.

A record of autopsies on sheep in Kentucky over two and a half years shows that parasites were the cause of death in 25%, pregnancy disease in 20%, pneumonia in 10% and plant poisoning and navel ill, each in 5%. Poor husbandry and malnutrition are directly and indirectly the causes of very great loss. Parasitism is not discussed, most of the paper being concerned with pregnancy disease and poisonous plants. Pregnancy disease occurs in January and February, just prior to lambing, and is essentially due to malnutrition with parasitism as a predisposing factor. The use of well-fed, well-developed ewes for breeding is suggested as the best method of prophylaxis. Plant poisoning is commonest in early spring and during periods of drought, when weeds may be more abundant than forage plants. The difficulty of diagnosis is emphasized.—A. WILSON TAYLOR.

I. ANON. (1937). **Diseases of Swine.**—*Vet. Med.* **32.** 103-160. Numerous figs., 1 table. [Numerous refs.]

II. ANON. (1937). **Report of Committee on Transmissible Diseases of Swine [U.S. Live Stock Sanit. Ass.]**—*J. Amer. vet. med. Ass.* **90.** 306.

I. This title refers to a complete number of the journal devoted to diseases of swine, the numerous articles being assembled by KINSLEY, A. T. who himself contributes several of them. Short notes, such as upon the secondary hosts of the worm *Metastrongylus apri* and coccidiosis in pigs, and not listed in the table of contents, occur throughout the text. [Several articles upon pigs are also deferred for a later number of the journal through lack of space].

II. This Committee is of the opinion that swine fever, enteritis and swine erysipelas continue to be the major transmissible diseases of swine in the order named.

The extensive drought in the corn-belt states caused a reduction of the pig population and lowered the quality of the food produced. Although these major diseases were less prevalent during the late summer and autumn months, the Committee warned veterinarians that losses following vaccination against swine fever and from infectious diseases affecting breeding animals were to be feared during the following winter and spring through food deficiencies.—C. V. WATKINS.

OLSSON, E. (1937). Från praktiken. [**Disorders and Diseases of Foxes**].—*Svensk VetTidskr.* **42.** 61-64.

The author, who is veterinary adviser for the Swedish Fox Breeders' Association, here reports some experiences learned from practice and practical experiments.

Controlled trials with "prolan" and "antex leo" in treating inadequate oestrus in vixens proved these remedies to be of little value, whilst "unden" ("igefa") proved promising in certain cases.

Wheat germ oil injected into males reluctant to mate gave good results, the dose being 2-3 c.c. on the day before mating was expected to take place. Its effect on infertility in vixens was uncertain.

A short review of the commoner fox maladies, such as mortality in cubs, jaundice, distemper-like diseases, tetany (rachitic) and enzootic encephalitis is also given. Critical analyses of the diagnoses of distemper proved them in most cases not to be true dog distemper.—GUSTAV NAERLAND (OSLO).

HARE, T. (1937). **A Study of 110 Consecutive Cases of Disease in Pigeons.**—*Vet. Rec.* **49.** 680-686. 1 table.

The birds were received for *post-mortem* or clinical examination during the years 1935 and 1936. Twenty-six different diseases were encountered and these are described under the following headings :–

(a). Bacterial or Virus Infections.—This includes 12 cases of pigeon pox ; 6 of paratyphoid (*Salmonella aertrycke* infection) ; 2 of pasteurellosis (*Pasteurella aviseptica* infection) ; 2 of streptococcal septicaemia ; 9 of salpingitis ; 3 of granulomata, and 3 of septic corns.

(b). Fungus Infection.—2 cases of aspergillus infection.

(c). Protozoan Infections.—Under this heading are included 17 cases of coccidiosis and 4 of trichomoniasis.

(d). Helminthiasis.—This includes 19 cases of capillariasis and one of ascariasis.

(e). Ectoparasites.—One case of feather rot caused by *Cnemidocoptes laevis*.

(f). Systemic Lesions.—19 cases are recorded in this group which includes goitre, neoplasms, ovarian haemorrhage, splenic haemorrhage, cardio-vascular disease, and cirrhosis of the liver.

(g). Physical Injuries.

(h). Congenital Defects.—R. F. Gordon.

Hellesnes, P., & Holmboe, F. V. (1937). Bakterieinfeksjoner i tilslutning til ixodeinvasjon hos lam. [**Bacterial Infection Following Tick Infestation in Lambs**].—*Norsk VetTidsskr.* **49.** 41-50. [5 refs.] [English summary].

A disease in lambs occurring in certain districts along the west coast of Norway, the most serious plague to sheep raising, and locally known as " fodasyke ", is here described. At the beginning, the disease is characterized by skin inflammation (eventually abscesses) leading to a quick recovery, to septicaemia and death within a few days, or to pyaemic polyarthritis and secondary peri-arthritis, accompanied by metastatic lesions in the spinal cord, liver, kidneys etc. with prolonged illness, unthriftiness and emaciation. The infection was proved to take place through tick bites and thus differed from swine erysipelas arthritis in lambs. The affection is strictly localized to tick-infested pastures.

In the advanced septicaemic type streptococci were usually found, in one case even the haemolytic type. In cases of polyarthritis and abscess formation staphylococci were commonly isolated, but one case each of infection with *Corynebact. pyogenes* and streptococci were also found.—G. Naerland (Oslo).

Marcato, A. (1937). Pneumatosi cistica linfogangliare nel cavallo. [**Cystic Pneumatosis of Lymph Nodes in the Horse**].—*Nuova Vet.* **15.** 72-76. 5 figs.

M. has examined the lungs of two horses obtained from an abattoir. They were hard to the touch and of a greyish colour that persisted below the surface. On incision numerous hard, whitish, shiny nodules were found and there were also signs of peribronchitis. A quantity of mucus appeared in the trachea and bronchi, the connective tissue was veined and crackly, and there were many small cysts containing odourless gas.

M. gives diagrams illustrating his examination and showing the presence of lymphocytosis and chronic peribronchitis.

He concludes that horses, as well as cattle, suffer from interstitial pulmonitis associated with cystic pneumatosis of thoracic lymph nodes, the air passages thus being closed before there has been complete expiration.—S. F. J. Hodgman.

Schwarte, L. H., Biester, H. E., & Murray, C. (1937). **A Disease of Horses Caused by Feeding Moldy Corn.**—*J. Amer. vet. med. Ass.* **90.** 76-85. 7 figs. [4 refs.]

A condition known as mouldy corn poisoning, cornstalk disease, leuco-encephalitis or acute haemorrhagic encephalitis has often been confused with specific equine encephalomyelitis caused by a filtrable virus. Feeding of mouldy corn (maize) was responsible for the death of a considerable number of horses in Iowa during the winter and early spring months of 1934 and 1935. Although the cases were diagnosed clinically as specific virus encephalomyelitis, examination of the brains of these horses failed to show any evidence of the virus disease. The condition was produced in five horses under experimental conditions by feeding the suspected mouldy corn. The symptoms produced were those of marked intoxication and severe incoordination. Examination of the brain showed liquefactive necrosis of the white matter of the cerebral hemispheres; perivascular cuffings and neuronophagia, which are invariably present in the virus disease, were absent. Other *post-mortem* findings are compatible with a severe toxaemia. The origin of the toxin remained undetermined.—N. J. Scorgie.

Apostoleanu, E., & Vladutiu, O. (1936). Recherches expérimentales sur les eaux aux jambes.—Contributions à son étude et à son traitement. [**Lymphangitis in Horses**].—*Arhiva vet.* **28.** 81-129. 24 figs. [Numerous refs.] [In French].

A study of non-contagious lymphangitis of horses, the actual condition dealt with, however, being a malignant form of the disease associated with gangrene and sloughing. It opens with a review of the theories of causation which have been advanced from time to time. The main feature is an account of an extensive trial of the following four lines of treatment as carried out by A. and V., namely, (1) subjection of the lesions to warm air; (2) vaccine therapy by means of a polyvalent stock vaccine; (3) vesication with cantharides, and (4) the action of ultra-violet rays. Of these measures vaccination gave the most promising results. The authors discuss the question of infection and experimental reproduction of the disease, its seasonal incidence and the bacterial flora of the lesions. The importance of good hygienic conditions in its control is stressed.—C. Davenport.

Malkani, P. G. (1937). **"Kumri" (Second Progress Report).**—*Indian J. vet. Sci.* **7.** 1-7. [2 refs.]

This report is based on the investigation of seven typical cases of kumri. It covers all aspects of *ante-* and *post-mortem* examination except the histopathology of the central nervous system which still awaits attention. The *post-mortem* findings are given in considerable detail and include a record of a number of investigations of possible causative factors. These, though giving negative results, are of value in the elimination of protozoan and filarial parasites as causal agents. Symptoms are well described and the uniformity of the syndrome in the seven cases leads M. to conclude that he is dealing with a definite morbid entity. A thick sedimenting urine rich in phosphates and showing cylindroids on microscopic examination was constantly present in all the cases. This is regarded as a diagnostic feature. Schistosomes were found in the liver of every case.—C. D.

Neumann-Kleinpaul, K., & Tabbert, B. (1936). Zur Aetiologie und Pathologie der Recurrenslähmung des Pferdes. [**Paralysis of the Recurrent Laryngeal Nerve of the Horse (Roaring)**].—*Arch. wiss. prakt. Tierheilk.* **70.** 413-425. 9 figs. [Numerous refs.]

The authors in an attempt to discover the cause of roaring in the horse con-

ducted experiments on 4 horses. The experimental animals were examined clinically and by means of the rhinolaryngoscope and were found to be sound in wind and healthy in all other respects. The authors then produced roaring artificially in the four animals as follows :

(1). By resection first of the left recurrent nerve and then 40 days later, as there was no important change, resection of the right recurrent nerve. Tracheotomy was necessary immediately after the second operation.

(2). By injection of 1 c.c. of strangles pus between the trachea and the carotid artery near the left recurrent nerve and 1 c.c. of strangles pus plus 10 c.c. normal horse serum near the right nerve.

(3). By injection of 3 c.c. of strangles pus over the left nerve and 1 c.c. of the same material on the right side, both injections made in the same region.

(4). By injection of 1 c.c. of oil of turpentine over the right nerve followed 4 weeks later by the injection of 10 c.c. of " neosalvarsan " over the left nerve and 4 weeks later still by a further injection of 3 c.c. of oil of turpentine over the left nerve.

Result.—In cases (1) and (2), complete roaring. In cases (3) and (4) a slight degree of roaring was discovered clinically and by means of the rhinolarygoscope which was not found in later examinations.

Post-mortem examinations revealed changes in the laryngeal muscles and degeneration of the nerves in ratio to the degree of roaring in life. The authors suggest, that infection is the commonest cause of roaring as a result of toxic degenerations of the nerves. They point out, that owing to the close proximity of the bronchial and first mediastinal lymph nodes to the left recurrent nerve, this nerve can be influenced inflammation and pressure of the inflamed tissue will therefore cause symptoms to be seen first in the left side of the larynx.

—F. Freudenberg (Berlin).

I. Holz, K. (1936). Spezifisch-infektiöse und apoplektische Insulte des Zentralnervensystems. [**Specific Infections and Apoplectic Attacks of the Central Nervous System**].—*Z. InfektKr. Haustiere.* **50.** 193-212. [Numerous refs.]

II. Holz, K. (1937). Beiträge zur Pathologie des Zentralnervensystems. V. Zur Entstehung der Ependymitis granularis des Pferdes. [**Pathology of the Central Nervous System. Ependymitis granularis in the Horse**].—*Berl. tierärztl. Wschr.* Jan. 29th. 65-68. 3 figs. [2 refs.] [See also *V. B.* **6.** 822].

III. Frauchiger, E. (1936). Vergleichende Betrachtung einiger Nervenkrankheiten. [**Comparative Study of Nervous Diseases**].—*Schweiz. Arch. Tierheilk.* **78.** 353-365.

I. The purpose of this paper is to distinguish apoplectic attacks occurring during the course of specific infections from those which, while being due to a variety of different factors not associated with infectious diseases, can be regarded as truly apoplectic in character. In man, arteriosclerosis is the commonest vascular disease responsible for apoplexy, but this condition does not occur in the horse.

A number of cases of encephalomyelitis are described to illustrate the varying distribution of the haemorrhages which may occur, *e.g.*, isolated large haemorrhages, single or multiple miliary or submiliary haemorrhages.

Among the causes of apoplexy unassociated with infections, H. mentions ependymitis granularis, pseudo-calcification of vessels, and endothelial proliferation due to causes the nature of which could not be determined. The characteristic feature of this group of conditions is that primary inflammatory changes such as

perivascular infiltration are absent. In infections, inflammatory changes are prominent and are often accompanied by thrombosis of the venous sinuses.

II. This condition is not uncommon in horses in Württemberg. Its characteristic anatomical feature is the presence of ependymal granulations, which may (as in one of the cases described), be of such a size as to occlude the aqueduct of Sylvius. In other cases it is not possible to arrive at a diagnosis except by histological examination. The first change appears to be a subependymal inflammatory oedema in the course of which areas of the ependymal layer undergo necrosis. This is followed by the formation of granulations and regeneration of the ependyma and there occurs at the same time a marked perivascular lymphocytic infiltration in the brain and pia mater.

H. considers that infection with the virus of equine infectious anaemia is one cause of the condition.

III. The purpose of this article is to stress the importance of comparative neurology and to show by examples, how the more careful study of the nervous diseases of animals may throw light on many obscure neurological conditions in man. Diseases in man such as those due to alcohol, cocaine or to syphilitic infection have no counterpart in animals. Diseases such as " Dummkoller " (believed due to an inherited hydrocephalus) in the horse and ossifying spinal meningitis in dogs appear to be peculiar to animals. Many nervous diseases of animals, however, have points of similarity with human diseases and the study of these is likely to result in considerable additions to our knowledge of human neurology. In this group F. deals briefly with such conditions as Borna disease, dog distemper (nervous form), syringomyelia in rabbits and hydrocephalus in dogs, etc. The human neuroses, it is suggested, might also benefit from a study of similar conditions in animals : Pavlow claimed that the study of conditioned reflexes in dogs held the solution of many of these problems.—E. G. White.

Cuillé, J., & Chelle, P. L. (1936). La maladie dite tremblante du mouton est-elle inoculable ? [**Scrapie (" Tremblante ") in Sheep**].—*C. R. Acad. Sci., Paris.* **203.** 1552-1554.

[It is to be emphasized that " scrapie " (" tremblante ", " Traberkrankheit ") is not to be confounded with " louping ill "].

The authors record the successful experimental transmission of " scrapie ". Nine healthy sheep were inoculated with suspensions prepared from the cerebrum or medulla of sheep which were naturally affected with the disease. Of the 9 animals 7 succumbed to intercurrent affections or were destroyed for special reasons after periods varying from 6 to 9 months after inoculation. The remaining two animals, which had been inoculated intra-ocularly, both developed similar characteristic symptoms of " scrapie ". The condition was progressive ; the first animal was destroyed in the last stages of illness 6 weeks after the first appearance of symptoms and the second died 2 months after the appearance of symptoms. The incubation period was long – 16 months in one case and 22 months in the other. Pruritus was marked around the region of the inoculated eye of the first animal and over the lumbar region of the second. The authors conclude that " scrapie " is infectious and inoculable and that the virus exists in the nerve centres.—D. R. Wilson.

Brownlee, A. (1936). **Paralysis in Fowls and Scrapie in Sheep. (A Comparison).** —*J. comp. Path.* **49.** 328-335. [20 refs.]

B. reviews the literature on fowl paralysis and " scrapie " in sheep and draws attention to the similarities in the characters which are generally accepted as

features of the respective diseases. In both there is a period of long incubation, an age of maximum incidence, typically little or no systemic disturbance, no known cause, invariably fatal termination, an association with high feeding, a prevalence in stocks improved by selective breeding, evidence that the disease is rarely, if ever, spread by contact, evidence that the cause of, and/or a predisposition to the disease are transmitted from the parent to the offspring, evidence that stock from " infected " parents may develop the disease on one farm and not on another and a similarity in the advocated methods of prevention.—D. R. WILSON.

I. BARBER, C. W. (1937). **A Study of Fowl Paralysis.**—*Cornell Vet.* **27.** 42-57. 1 table. [8 refs.]

II. JOHNSTON, J. W., & WILSON, J. E. (1937). **Observations on an Outbreak of Fowl Paralysis.**—*Vet. J.* **93.** 13-19. 4 tables.

III. HAMILTON, H. P. (1937). **Some Notes on Lymphomatosis gallinarum.**—*Ibid.* 21-25. 12 figs. on 4 plates, 1 table. [8 refs.]

IV. BAYON, H. P. (1936). **Primary Irido-Cyclitis in Fowls : A Condition Distinct from the Eye Lesions Occurring in Neuro-Lymphomatosis.**—*J. comp. Path.* **49.** 310-319.

I. The results of transmission experiments in which 484 chickens were used do not indicate that fowl paralysis can be transmitted. The experiments included intraneural and intraperitoneal inoculations of saline suspensions of diseased nerve tissue from paralyzed birds and intramuscular, intraperitoneal and para-neural inplants of similar nerves.

II. Experiments carried out with a flock in which there was a serious outbreak of fowl paralysis show that when chicks are transferred as day-olds and kept strictly isolated from the parent stock there is a very marked decrease in the mortality rate of the isolated stock and a great reduction in the incidence of fowl paralysis among them. Chicks from the same stock reared in the parent colony acted as controls and showed a high incidence of fowl paralysis.

In another isolation experiment chicks were removed when eight weeks of age to an outlying part of the farm where either new or sterilized equipment was used and where poultry had not previously been kept ; but this was completely unsuccessful in controlling the disease.

Eggs obtained from a stock which could be considered to be free from fowl paralysis were transferred to the stock where the disease was known to be prevalent, and were hatched out among control eggs from the diseased stock. The chickens from both groups of eggs were exposed to maximum contact with the original diseased stock, and it was found that pullets from the fowl paralysis-free flock became affected with fowl paralysis to the same extent as the control birds.

Nutrition appeared to have no appreciable effect in controlling the disease.

III. A statistical analysis of 1,475 fowls received for *post-mortem* examination showed that 633 or 42·9 % were diagnosed as lymphomatosis. Histological examination was carried out on various organs and nerves from all these 633 birds and it was found that lymphomatosis occurred in 16 different organs, excluding nerves, and in 11 different nerves as well as brain and spinal cord. The most commonly affected organs were the ovary, liver, spleen, kidney, mesentery, intestines and lungs.

H. states that lymphomatosis can only be definitely diagnosed by a histological examination, and that many nerves which macroscopically appear enlarged are found on histological examination to be free from lymphoid infiltration. Conversely, many macroscopically normal nerves on microscopic examination are found to be infiltrated with the typical lymphoid type of cell. Out of 201 fowls

examined 79 cases were found in which nerves macroscopically normal were found, on histological examination, to be infiltrated in varying degrees.

IV. B. records three outbreaks of a peculiar morbid condition of the eyes in fowls, which, though very similar to the irido-cyclitis occurring in connexion with neuro-lymphomatosis, yet differed in its incidence and course, and can be considered a distinct disease. A relatively large number of birds were involved, and no symptoms of paralysis were observed before, during or after development of the eye lesions. There is no clear cut difference between the anatomical lesions in the eyes of birds with primary irido-cyclitis when compared with those seen in the eye affection occurring in the course of fowl paralysis. The aetiology of the condition is obscure ; but on two farms the frequent occurrence of eye lesions was preceded by the appearance of " colds " the previous season. Treatment is of little use.—R. F. Gordon.

Bleil, E. (1936). Erythrozytometrie bei kranken und gesunden Tieren (Hund, Pferd). [**Size of Erythrocytes in Healthy and Sick Dogs and Horses**].—*Inaug. Diss., Giessen.* pp. 32. 6 tables. [Numerous refs.]

B. states that a new erythrocytometer, which is used in human medicine, can be used also in veterinary medicine. The measurement of the size of erythrocytes is of no value in the diagnosis of diseases of horses and dogs.—F. F. (Berlin).

Kucel, J. (1936). Prilozi poznavanju aktivnih plućnih kongestija preživača kod nas. [**An Acute Pulmonary Congestion of Cattle in Yugoslavia**].—*Jugoslov. vet. Glasn.* **16.** 505-520. [5 refs.] [German summary].

K. describes an acute pulmonary congestion of cattle and sheep, mostly observed in the spring when the animals are allowed to leave their stalls for their pastures, but to some extent in summer also. The illness sets in suddenly associated with tremor, dyspnoea, increased temperature and indigestion. *Post mortem*, pulmonary oedema is the chief lesion. The illness can be easily confused with anthrax.

The disease appears to be related to sudden changes in the weather.

—B. Oswald (Skoplje).

Popov, A. A. (1936). Legočnaja bolezn teljat severnych olenej. [**Lung Disease in Reindeer Calves**].—*Sovyet. Vet.* No. 9. pp. 22-25.

P. describes a lung disease caused by a small Gram-negative bacillus which on inoculation reproduced a similar disease in rabbits. The reindeer calves had general ill health with nasal discharge, rapid pulse and rapid respirations. The lungs showed patchy pneumonia with suppurative foci and there was pleurisy, and sometimes pericarditis.

Stockard, C. R. (1936). **An Hereditary Lethal for Localised Motor and Preganglionic Neurones with a Resulting Paralysis in the Dog.**—*Amer. J. Anat.* **59.** 1-54. [Copied *verbatim* from *Physiol. Abstr.* **21.** 566. Signed H. A. Harris].

Paralysis of the hind limbs occurs in the St. Bernard and Great Dane dogs. The condition is seen in the progeny of non-paralysed dams and sires. The numerical results indicate that the palsy is dependent on at least three underlying genes, which are a definite lethal for certain motor and preganglionic sympathetic neurones in the lateral and anterior horns of the lumbar region of the spinal cord. Certain similarities between this palsy in puppies and a so-called hereditary type of Werdnig-Hoffmann palsy in children are discussed.

Nai, D. D. (1936). Ricerche sulla isto-patologia dei postumi aftosi: Una particolare lesione della ipofisi nella vacca pelosa. [**A Pituitary Lesion in Hairy Cows (Sequel to Foot and Mouth Disease**)].—*Clin. vet., Milano.* **59.** 355-369. 2 text figs., 8 figs. on 4 plates. [Numerous refs.]

N. gives statistics proving that young milch cows are most commonly affected, but that calves and bulls can be victims. He compares the " hairy " condition in appearance to the coat of Highland cattle, but it lies closer to the skin and is very coarse.

It is densest behind the scapula and in the flank. It is not noticeable in mild cases. Common symptoms are – falling off of milk, bad condition despite ravenous appetite, dyspnoea, cardiac asthma, rapid heart-beat and venous pulse. N. has studied 31 cases in all stages of the disease, of which all but 4 died of syncope. He details symptoms during life and describes P.M. findings both macroscopically and microscopically. These he illustrates with plates. He discusses several theories to account for the " hairy " symptom, his own being that the disease affects the pituitary gland and, through it, the hair follicles. [The author does not produce any evidence that the pituitary gland was affected in these cases]. —S. F. J. Hodgman.

Wollenweber, N., Wüstenberg, J., & König, F. (1937). Ueber das Vorkommen von Enteritisinfektionen bei Katzen und ihre Ueberträgung auf den Menschen. [**The Occurrence of Enteritis in Cats and its Transmission to Man**].—*Zlb. Bakt. I.* (*Orig.*). **139.** 169-172. [4 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 631. Signed J. C. Cruickshank].

A case of enteritis due to *Bact. typhi-murium* was found to have been preceded by the death in the same house of a cat after an illness of a dysenteric character. Investigation showed that there had been a considerable epidemic of such a disease with high mortality amongst the cats of the district over a period of 6 months. The stools of 46 more individuals were examined, but the only positive finding was that the wife of the first patient was a carrier. The organism was also isolated from the bodies of two cats exhumed, and a cat was experimentally infected with the organism in milk. In 4 days it became ill with slimy diarrhoea and the organism was recovered from spleen and intestines when the animal was killed after 10 days' illness. No infected mice were found in the vicinity.

Gehring, K. (1937). Veränderungen an den Eihäuten des Rindes. [**Changes in the Placenta of Cattle**].—*Berl. tierärztl. Wschr.* Jan. 15th. 33-36 and Jan. 22nd. 49-52. 9 figs. [14 refs.]

Examining normally detached placentas of cows which seemed to be clinically healthy G. frequently found changes in the placenta, necrosis of chorionic villi and oedema caused by permanent alterations at the caruncles of the uterus. These pathological processes are due to trauma and inflammation during former pregnancies. The reduction of the placental surface caused by the said changes leads to undernutrition of the foetus, and in extreme cases even to death. Necrosis of the villi is thought to be the direct cause of retained placenta. G. points out, too, that exact observation of the foetal membranes gives a good insight into the genital constitution and breeding value of the cattle.—G. Hartmann (Vienna).

Liebsch, E. (1936). Die Retentio secundinarum des Rindes. I. Mitteilung. Das neueste Schriftum über die Therapie. II. Mitteilung. Das neueste Schriftum die Aetiologie. III. Mitteilung. Eigene klinische und therapeutische Erfahrungen. [**Retained Placenta in Cattle. I. Recent Litera-**

ture on Therapy. II. Aetiology. III. New Clinical Experience].—*Arch. wiss. prakt. Tierheilk.* **71.** 1-16, 17-22 and 23-40. 6 tables. [Num. refs.]

A review of the recent literature.

As antiseptic irrigations of the uterus were found often to be irritant, treatment designed to aid involution of the uterus and have a cleansing effect on it were tried. Charcoal was used for this purpose in uteri from which the placenta had been manually removed. Attempts were also made to find an easy treatment which might eliminate the necessity for manual removal by substances which have a digestive and fermentative action on dead tissue (parenchymatol-yeast-charcoal-pepsin, etc.): they failed. Chinosol, aniline dyes and non-specific cellular therapy have also been used to treat severe metritis with general disturbance.

Retained placenta begins primarily as a placentitis most commonly associated with *Br. abortus* infection, and is predisposed to by general or local disease conditions which hinder the expulsion of the placenta by mechanical or other means. General debility of whatever origin is sometimes a predisposing cause to retained placenta.

The author gives the results of his treatment by various methods, of 170 cows. He classified the causes of retained placenta as (a), mechanical, (*b*) general bodily weakness, (c), local uterine weakness, and found that 34% of his cases fell in group (c), whilst 47% were obscure in their origins. *Br. abortus* infection accounted for nearly all in group (c).

The subsequent breeding and general history of the author's cases did not vary appreciably according to whether they were given uterine antiseptic irrigation, dry treatment by antiseptic pessaries or no treatment. The author concludes that the only rational treatment is manual removal.—G. Hartmann (Vienna).

Hallenborg, T. (1937). Ofruktsamhet hos sto och behandlingen av den nyfödda fölungen. [**Sterility in Mares and the Treatment of New-Born Foals**].—*Svensk VetTidskr.* **42.** 79-94. 5 figs. [11 refs.]

H. believes that unnatural foods, lack of vitamins and mineral deficiencies are paramount factors in the causation of sterility in mares. He finds support for this view in the Norwegian horse-breeding " seters ", which are mountain pastures situated 1,000-1,500 m. above sea level, on which each selected stallion, along with 40 to 50 mares, is turned out every summer. It is rare for a mare to return from the pastures in the autumn without being in foal.

Besides proper care of the umbilical cord and a clyster to remove meconium the most effective prophylactic treatment has been found to be an injection (intraven.) of up to 1 g. of " entozon " in solution. Although not specific to the organisms causing navel-ill, " entozon " is said to increase general phagocytosis and this is considered to be of great value in resisting the infection.—G. N. (Oslo).

Keller, K., & Niedoba, T. (1937). Untersuchungen an Doppelmonstren des Rindes im Sinne der Zwillingsforschung. [**Bovine Double Twin Monsters**].—*Z. Zücht. B.* **37.** 245-293. 30 figs. [Numerous refs.]

K. and N. carried out a complete study of 20 bovine double monsters, particular attention being given to the characters of the head. Considerable differences of structure were commonly found between the two heads and, as has previously been noted in man, there may exist differences more marked than those existing between separate monozygotic twins. Bovine double monsters not uncommonly show local errors of development such as cleft palate and hare-lip.

They consider that the mechanism of production of double monsters is different from that which results in twins derived from a single ovum (" eineiige Zwillinge ").

The latter are not only – in both man and animals – almost identical, but are usually perfectly formed. One factor which possibly plays a deciding part is the stage of development at which partial or complete separation occurs.—E. G. W.

Benson, K., Plum, N., & Portman, K. (1937). **Contribution to Elucidation of the Etiology of Nymphomania.**—*Skand. VetTidskr.* **27.** 173-183. 2 tables. [1 ref.] [In English: Swedish summary].

Thirteen nymphomaniac cows were treated, either alone (7 cases) or in connexion with enucleation of ovarian cysts (6 cases), with prolan from urine in a dose of 1,000 M.U. given in three or four injections (subcut.). While not very convincing, the results seemed to support the presumption that nymphomania is due to a dysfunction of the hypophysis, causing a quantitative or qualitative deficiency of gonadotropic hormone production.—G. Naerland (Oslo).

Glembockij, J. L., & Moiseev, S. B. (1935). Nasledovanie kriptorchizma u ovec. [**Inheritance of Cryptorchidism in Sheep**].—*Usp. Zooteh. Nauk.* **1.** 5-28. 5 figs., 9 tables. [English summary].

On an inspection of a horned breed of sheep at the Kotovsky sheep-breeding farm 138 (15%) of the ram lambs born in 1934 were found to be cryptorchid, nearly all bilaterally affected.

The genetical aspects were investigated and it was found that cryptorchidism was connected with hornlessness.

Volhard, F. (1936). Die Nephrosen. [**Nephrosis**].—*3rd int. Congr. comp. Path. 1936.* **1.** Pt. I. Med. Sect. 325-394. 1 plate. [Numerous refs.] [In German: French summary].

The term " nephrosis " was first used by Müller in 1904 to denote changes in the kidney of a purely degenerative character or in which inflammation played a doubtful part. Much work has been done on the pathology of the kidney since that time and a more fundamental definition of the term is called for.

In nephritis there is functional interference with the blood flow through the glomeruli – in glomerulonephritis this damage affects all the glomeruli of both kidneys. In nephrosis, the blood supply is normal, but the glomerular capillaries become abnormally permeable to protein. There follows a fall in blood and tissue protein which is the result of the severe albuminuria. Oedema is produced in both conditions but, whereas in nephritis it is due to disturbance of the circulatory system, in nephrosis it is the result of loss of tissue protein. —E. G. White.

Höfliger, H. (1936). Ueber Organdystopien bei Haustieren mit besonderer Berücksichtigung der Ectopie cordis und der sog. Zwerchfellbrüche. [**Organ Dystopia in Domestic Animals with Special Reference to Ectopia Cordis and Diaphragmatic Hernia**].—*Virchows Arch.* **297.** 627-644. 8 figs. [Numerous refs.]

H. describes with the aid of photographs and diagrams three interesting types of developmental abnormality.

The first was a case of cervical ectopia cordis in a calf. The animal lived only 5 hours and a pulsating swelling was noted on the ventral aspect of the base of the neck. Failure of the heart to descend into the thorax during development produced remarkable abnormalities in this organ and in the great vessels. The right auricle was formed by three large venous trunks – posterior vena cava and right and left anterior venae cavae. The aortic arch showed abnormal branching.

The second case described is a newborn piglet with a thoraco-abdominal fissure and pectoral ectopia cordis. The abdominal organs occupied a hernial sac situated between the sternum and umbilicus.

Congenital left-sided defect of the diaphragm is recorded in three piglets of the same litter. Various abdominal organs were situated in the left pleural cavity. —E. G. White.

Følger, A. F. (1937). Traek af Betaendelsens og Svulstdannelsens almindelige Patologi. [**Aetiology of Tumours**].—*Medlemsbl. danske Dyrlaegeforen.* **20.** 137-151.

A brief review of modern aspects of the general pathology, including aetiology, of inflammation and tumours.—Gustav Naerland (Oslo).

Innes, J. R. M. (1937). **Malignant Disease in Animals and its Implications as Regards the Cancer Problem as a Whole.**—*Vet. Rec.* **49.** 652-655.

In animals, as in man, the determination of malignancy is of great importance. Whilst histological features provide the chief basis for diagnosis, such factors as the anatomical location of the tumour, its attachments, the presence of a capsule and the age and condition of the patient should receive due attention. Only in this way is it possible to form an opinion regarding the relation of histological structure to the course and prognosis of malignant disease.

Of 25 testicular tumours in dogs, 20 proved to be seminomas. The epididymis was never involved and in those cases where the animal's subsequent history was obtained there was no recurrence or spread for as long a period as 5 years.

The spread of mammary tumours in the bitch and the distinctions between neoplasia and chronic inflammatory processes, often with metaplastic formation of cartilage and bone, are discussed.

The formation of a registry of animal tumours is urged, the data to include type of tumour, history of growth, malignancy and post-operative survival. —E. G. White.

Jackson, C. (1936). **Essays on the Cancer Problem. IV. Neoplastic Diseases in Poultry.**—*J. S. Afr. vet. med. Ass.* **7.** 69-85. [12 refs.]

In a study of 203 cases of avian neoplasia investigated at Onderstepoort, only 9 benign tumours were encountered, the remainder being malignant. The commonest malignant tumours met with apart from the lymphocytomata were the carcinomata. These carcinomata were mainly associated with the reproductive organs of the female. A description is given of the varieties of leucosis—lymphoid, myeloid and erythroleucosis and the opinion is expressed that the problem of the leucotic diseases of birds is inseparably bound up with that of tumours.—E. M. R.

Krupski, A., & Almasy, F. (1937). Untersuchungen über den Ca-P-Stoffwechsel normaler und kranker Rinder. [**Calcium-Phosphorus-Metabolism in Normal and Sick Cattle**].—*Schweiz. Arch. Tierheilk.* **78.** 514-524. 1 fig., 2 tables. [18 refs.]

Although the calcium and phosphorus metabolism in cases of bone diseases has been studied and the results are well-known, little has been done with regard to the mineral metabolism of other maladies.

In the experiments described the calcium and phosphorus metabolism during such diseases as tuberculosis, Johne's disease, actinomycosis, coccidiosis, and pyelonephritis was investigated. The technique employed was to collect the daily output of faeces and urine by means of bags strapped to the animal and to estimate

the daily percentage concentration of calcium and phosphorus in the faeces and urine. The calcium and phosphorus content of the blood serum was estimated. This procedure was carried out on nine normal cows and the variations noted and compared with the variation in cases of the above mentioned diseases. The number of cases of any one disease studied was far too small to allow of any conclusions being made. [It is doubtful if results obtained by this technique could be relied upon].—James Stewart.

PUBLIC HEALTH.

I. Brooks, P. B., & Tiedeman, W. von D. (1937). **Relation of Bovine Mastitis to Human Disease.**—*Amer. J. publ. Hlth.* **27.** 334-338. [14 refs.]

II. MacNabb, A. L. (1937). **Discussion [on Paper Entitled "Relation of Bovine Mastitis to Human Disease" by Brooks and Tiedeman,** *Amer. J. publ. Hlth.* **27.** 334-338].—*Ibid.* 338-340.

I. Mastitis occurs in all herds and in some cases the incidence is as high as 80-90%. It is usually due to streptococci loosely classified as *Streptococcus agalactiae* but occasionally it may be due to staphylococci and rarely to *Bact. coli*. Such streptococci are regarded as harmless to man but it is sometimes held that they are the cause of gastro-enteritis in infants. In rare cases udders may become infected with *Str. pyogenes* from human sources and may cause septic sore throat and scarlet fever. In such cases infection of the udder usually follows a teat injury. Staphylococcus toxins from cases of mastitis have been responsible for outbreaks of gastro-enteritis. Milk from mastitis-infected udders should be regarded as potentially dangerous until pasteurized.

II. MacNabb said that *Br. abortus* in the udder may act as a predisposing cause in the development of streptococcal or staphylococcal mastitis. Mastitis was not only important in milk hygiene but also in meat inspection. Carcasses from affected cows were liable to be condemned for pyaemia.—H. E. Bywater.

—. (1937). [Papers by Savage, W. G., Minett, F. C., & Scott, W. M.] **Discussion on Milk as a Factor in the Cause of Disease.**—*Proc. R. Soc. Med.* **30.** 951-960. [Numerous refs.]

Savage contended that the evidence is overwhelming that milk is a widespread vehicle of infection. He summarized the evidence with regard to tuberculosis and said that the estimate that, in this country, 6 per cent. of all deaths due to tuberculosis were of bovine origin must be accepted as the minimum. All bulked milk contains tubercle bacilli whilst 6-7% of unbulked raw milk is infected.

Streptococcal mastitis is harmless unless the infection is of human origin, but it is difficult to estimate the risk of this owing to the lack of statistics. Salmonella infections are in many cases traceable to infected cows, and he has personal knowledge of 20 such outbreaks. The symptoms are often severe but the mortality is very low.

He considers that man is not readily infected with *Br. abortus* and that the risk of infection with anthrax and foot and mouth disease from milk is negligible.

M. said that graded milk appears to be a greater source of brucella infection than ordinary milk, due to the fact that tubercle bacilli effectually prevent invasion by *Br. abortus*.

Infection of the udder with streptococci of human origin is important since wide-spread and continuous epidemics cannot be due to casual and intermittent contamination of the milk at the time of milking unless the organisms can grow

easily at atmospheric temperature; *Str. pyogenes* will grow only slowly in commercially sterilized milk, and in raw milk the growth is inappreciable before the milk sours. It appears that an injury to the udder is necessary before the bacteria excreted by a milker can enter and multiply in it.

Scott mentioned an outbreak of enteric fever where the cows drank from a pond infected with sewage effluent. He suggested that infection may have resulted from surface contamination of cows' udders and legs or the bacteria may have been excreted in the dung. The possibility of the bacteria multiplying in the intestinal tract, as in the case of man, and then being excreted in the milk should be investigated.—H. E. Bywater.

Cerrutti, C. F., & Boffa. (1937). Le controle hygiénique du lait destiné à être consommé cru. Résultats de nos observations après seize mois de controle. [**Hygienic Control of Milk Intended for Consumption in the Raw State**].—*Rev. Hyg. Méd. prév.* **59.** 248-287. 4 tables, 1 chart. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 590. Signed W. G. Savage].

The paper is a study, extending over 16 months, of the milk distributed from an establishment at Turin authorized to sell raw milk. The routine tests employed were acidity, methylene blue reduction, the alcohol test, number of bacteria (on agar) and the coli-aerogenes test. Their various findings are given and are definitely low. Thus the arithmetic mean figures for the number of bacteria were mostly well below 20,000, while out of 330 samples examined only 23 contained *Bact. coli* group organisms in 1·0 c.c. (6·9 per cent.). They did not find the reductase test [the old test] sensitive enough, while they do not attach much importance to the acidity estimation. They consider the bacteria enumeration test of great value, but place still higher the *Bact. coli* estimation. For milk to be consumed raw it should not contain more than 20,000 bacteria per c.c. and one should not tolerate members of the *coli-aerogenes* group in 1 c.c. They also carried out some tests for *Myco. tuberculosis* (cultural and inoculation), without finding it present, examinations for haemolytic streptococci and for *Brucella*. They consider that even the most extended control cannot guarantee the absence of pathogenic bacteria and that only pasteurization can ensure safety.

Maitland, Mary L. C. (1937). **Rapid Detection of *B. tuberculosis* in Milk.**—*Lancet.* **232.** 1297-1299. [4 refs.]

M. experimented to ascertain the most suitable technique for the preparation and examination, for *Mycobact. tuberculosis*, of samples of milk from individual quarters. She used the "cell group" method advocated by Torrance and Matthews and found that the deposits were most easily and efficiently examined and *M. tuberculosis* most frequently found when the milk was centrifuged for three minutes at 2,500 r.p.m.

Slides were best prepared by pouring off the cream and fluid from the centrifuge tubes, which were then inverted while two loopfuls of the deposit were transferred to a slide. The film was spread with another slide, dried for at least half an hour in air and then fixed in a flame which was not too hot. After cooling the slides were placed for 15 minutes in equal parts of alcohol and ether, washed with ether and stained by the Ziehl-Neelsen method (eight minutes with carbol-fuchsin and two minutes with Löffler's methylene blue).

It was found that cell groups tended to collect at the edges of the films and that 41 slides could be examined in one hour.

Quarter samples from 950 cows were examined and the results were confirmed by the biological test or by *post-mortem* examinations on the cows.—H. E. Bywater.

RUDDOCK-WEST, T. (1937). **Demonstration of Tubercle Bacilli by Cultural Method.**—*J. R. sanit. Inst.* **57.** 524-527.

1,742 samples of milk, from single cows, which had proved negative on microscopic examination were examined at the Norfolk County Public Health Laboratory by cultural methods.

Centrifuged sediment, treated with 2% H_2SO_4, and then neutralized with NaOH and washed, was used. Seventy-six samples were thus proved to be positive.

In each case tuberculous lesions were found in the cows' udders at subsequent *post-mortem* examination. Sixty-eight control samples were also tested biologically and in every case the results were identical.—H. E. BYWATER.

CAMPS, F. E., & WOOD, J. L. M. (1936). **An Outbreak of Epidemic Sore-Throat of Milk-Borne Origin.**—*Lancet.* **231.** 756-760. 1 fig., 4 tables. [7 refs.]

This outbreak of atypical scarlet fever occurred at Chelmsford in 1935 and involved some 1,600 persons (mostly adults). There were six deaths. It was of the usual explosive type associated with milk-borne epidemics.

The source of infection was a dairy receiving milk from three farms on one of which cases of sore throat existed amongst the milkers and their families, from whose throats *Streptococcus pyogenes* (Type II) were isolated. Similar organisms were later demonstrated in the milk at the Ministry of Health laboratory. No evidence of disease was found amongst the cows, except in one which had mastitis and from the milk of which bovine streptococci only were recovered.

Milk from the farm was withheld until arrangements had been made for its pasteurization.—H. E. BYWATER.

WATSON, R. (1937). **An Outbreak of Milk-Borne Scarlet Fever and Tonsillitis in Doncaster.**—*Brit. med. J.* June 12th. 1189-1193. 4 tables, 2 charts. [2 refs.]

This outbreak of scarlet fever and tonsillitis, complicated by adenitis, otitis media, quinsy and polyarthritis extending over 12 days, occurred in December, 1936. The outbreak was of the explosive type – 15 cases being reported during the first day – and was traced to milk from one farm, the milk being delivered by one retailer. Some 1,300 persons were supplied with the milk and of these 10% developed scarlet fever, whilst an additional 17% contracted sore throat. The majority of those affected were adults, and children under five years of age.

The infection was from a cow which at the time of the outbreak had a crushed teat but which otherwise appeared normal, although later it developed acute mastitis. Apparently the cow had been infected by the milker, who had been dressing the ear of a child suffering from otorrhoea, and himself was suffering from a sore throat. *Streptococcus pyogenes* (Type II) was isolated from the cow's udder, and also from the milker's throat. Although primary infection of the milk appeared to be from the cow, the possibility of direct contamination of the milk by the milker could be entirely ruled out. The cow's milk remained infected for some weeks.—H. E. BYWATER.

HUPBAUER, A., & BAKOTIĆ, L. (1937). Oboljenja ljudi i svinja nakon uživanja mesa priklane svinje. Infekcije sa Bact. suipestifer Kunzendorf. [**Meat Poisoning from Pork Infected with** *Salmonella suipestifer Kunzendorf*].—*Vet. Arhiv.* **7.** 49-60. 3 tables. [Numerous refs.] [German summary].

In July, 1934 in Virovitica (Yugoslavia) an epidemic broke out affecting man and swine, accompanied by nearly the same symptoms: vomiting, diarrhoea, sometimes with increased temperatures, depression and loss of appetite for a few

days, with pains in the abdominal and sacral regions in the human patients, and with weakness of the hind legs in swine. No deaths occurred among the 25 people affected, but 5 swine succumbed out of 48. It was found that this disease was due to pork from a pig which had been slaughtered in a morbid condition without any veterinary inspection, and then used for human consumption and also given to pigs.

The authors are of the opinion that this epidemic was meat poisoning caused by *Salmonella suipestifer Kunzendorf.* The organism was isolated both from human patients and affected swine.—B. Oswald (Skoplje).

THERAPEUTICS.

Anon. (1937). E. Merck's Jahresbericht über Neurungen auf den Gebieten der Pharmakotherapie und Pharmazie. 50 Jahrang. **[Merck's Yearbook of New Work on Pharmacology and Therapeutics. Vol. 50].** pp. xxxxvii + 430. 21 figs., 17 tables. [Numerous refs.] Darmstadt: E. Merck. [8vo].

This is a celebration number to mark the 50th successive year of publication of the annual report and contains many friendly messages, etc., in addition to the usual number of review articles on recent advances in therapeutics by famous medical workers, original pharmacological reports on new drugs and notes on materia medica. Prof. Oppermann of Hanover Veterinary College contributes an article on the importance of co-operation between clinical and the chemical-pharmaceutical industry for the further development of veterinary therapeutics. —J. E.

Singer, E. (1936). Die Wirkungsweise der Chemotherapeutika. **[Mode of Action in Chemotherapy of Protozoan Infections].**—*Med. Klinik.* **32.** 152-153. [2 refs.]

In aqueous or saline solutions atoxyl (1 : 10,000), " neosalvarsan " (1 : 10,000), etc., are chiefly deposited on the anode in cataphoresis. When they are diluted with rabbits' plasma, these substances are chiefly deposited on the cathode. The author concludes that chemotherapeutic agents have the power to form anions in colloidal media.—J. M. Robson.

Kunert, H. (1936). Arzneimittelwirkung bei Trypanosoma brucei. **[Drug Action on** *Tryp. brucei*].—*Z. ImmunForsch.* **89.** 431-434. [1 ref.]

The effectiveness of trypanocidal agents may vary when tested with different laboratory strains of the same type of trypanosomes. Schilling, Duke and Kleine and others have already shown that the organisms in a genuine infection may behave in a different manner to old laboratory strains.—J. M. Robson.

Kofoid, C. A., McNeil, Ethel, & Wood, Fae D. (1937). **Effects of Arsenicals on Trypanosoma Cruzi in Tissue Culture.**—*J. Pharmacol.* **59.** 424-428. 1 table. [4 refs.]

A new method for the study of the protozoicidal action of drugs is suggested. Of three arsenicals tested, arsenious tri-thio-salicylic acid is by far the most toxic for *Tryp. cruzi*; the drug is, however, toxic to tissue *in vitro*, and also highly toxic to mammals.—J. M. Robson.

von Jancsó, N., & von Jancsó, H. (1935). Chemotherapeutische Schnellfestigung von Trypanosomen durch Ausschaltung der natürlichen Abwehr-

kräfte. [**Rapid Drug Fastness obtained in Trypanosomes after Cutting off the Reticulo-Endothelium**].—*Z. ImmunForsch.* **85.** 81-105. [Num. refs.]

The reticulo-endothelial system was put out of action in rats by excision of the spleen and injections of copper; the animals were then injected with trypanosomes (nagana strain) and treated with "germanin". After 3-4 treatments with increasing doses of the drug, "germanin"-fast strains with a resistance 50 times as great as that of the initial strain were produced. In normal animals such treatments never produced any marked increases in resistance and several months are necessary to produce "germanin"-fast strains. These results are discussed. It is suggested that the production of "fastness" involves alterations in the permeability of the protozoa. Animals were injected with "germanin"-fast trypanosomes; injections of glucose prolonged life for 1-2 days.—J. M. Robson.

Grillo, J., & Schmitz, J. (1935). Chemotherapeutische Versuche bei Mischinfektionen mit zwei Trypanosomenarten. [**Chemotherapy of Mixed Trypanosome Infections**].—*Z. ImmunForsch.* **85.** 203-217. 2 tables. [18 refs.]

A mixed infection of rats with *Tryp. lewisi* and *Tryp. brucei* (which did not influence one another) had no effect on the natural resistance of rat trypanosomes against "germanin". The mixed infection produced no increase in the activity of the arseno-benzol derivative sdt 355 against rat trypanosomes. A nagana strain rendered free from blepharoplasts by treatment with sub-therapeutic doses of "trypaflavine" showed some fastness against "trypaflavine", but no increased resistance against "germanin".—J. M. Robson.

Fischl, V. (1935). Chemotherapeutische Prüfung einiger Pyrrolfarbstoffe. [**Trials with Pyrrole Dyes as Trypanocidal Drugs**].—*Z. ImmunForsch.* **85.** 77-80. [10 refs.]

Four pyrrole derivatives were tested for trypanocidal activity. Prodigiosin, the red dye of *Bacillus prodigiosus*, has appreciable activity; pyrrole blue, pyrrole red and phtalocyanin are without such activity.—J. M. Robson.

Oesterlin, M. (1936). Deduktive Chemotherapie? [**Problems of Chemotherapy of Canine Piroplasmosis**].—*Klin. Wschr.* **15.** 957-959. [9 refs.]

Piroplasmosis in dogs (*Babesia gibsoni*) is not affected by agents ("trypaflavine", arsenicals, acaprin) effective against other types of piroplasmosis. Hydroquinine is not effective either, but its peroxide does have a therapeutic action. Intramuscular injections of hydrogen peroxide transform piroplasmosis in dogs into a disease without symptoms and the animals become resistant against reinfections. —J. M. Robson.

Velu, H., Zottner, G., Miegeville, J., & Grimpret, G. (1937). Nouvelles recherches sur la chimiothérapie des piroplasmoses au Maroc (Zothélone et Gonacrine?). [**Chemotherapy of Piroplasmosis in Morocco**].—*Bull. Soc. Path. exot.* **30.** 20-26. 4 figs. [1 ref.]

Zothelone has no specific action against infections with *Theileria dispar*. It does possess some activity, presumably due to its action in reducing temperature. The course of the disease is not affected and the parasites do not disappear from the blood. "Gonacrine" has an equal, if not greater activity.—J. M. Robson.

Boynton, W. H., Wood, F. W., & Wood, Gladys M. (1937). **A Note on Treatment of Anaplasmosis.**—*N. Amer. Vet.* **18.** No. 5. 29-30. 1 table. [1 ref.]

The authors treated anaplasmosis in cattle with an intravenous injection of

one litre of 5% dextrose in distilled water to which had been added sufficient sodium cacodylate solution to make a dosage of 25-30 grains of the cacodylate per 100 lb. body weight. The results were good. 60 animals, in a herd of 375 mature animals, and 36 in 5 other herds (strength not given), had previously died, presumably from anaplasmosis but veterinary advice was not available at the time. 39 cases (all diagnosed clinically by veterinarians, 21 of which were confirmed in the laboratory) were treated, and 33 recovered. Recovered cases remained "carriers".—E. E. JELBART.

VON JANCSÓ, N., & VON JANCSÓ, H. (1936). Beziehungen zwischen chemotherapeutischer Wirkung, Oxydationskatalyse und Redoxpotential. [**Relations between Chemotherapeutic Action and the Oxidation Reduction Potential**]. —*Z. ImmunForsch.* **88.** 275-323. 10 tables. [Numerous refs.]

It has been found that a number of substances interfere with the therapeutic action of trypanocidal substances. A theory is enunciated according to which such interference is produced only by substances which form a thermodynamically reversible oxidation-reduction system and whose redox-potential lies within a certain potential range. The weak positive and negative dyes between potentials, in the scale of oxidation-reduction potentials, of +0·115 and −0·060 volt (toluylene blue-ethylcapril blue) all have a marked interference effect; an optimum interference effect is found at +0·011 volt. 8 dyes with a normal potential more negative than −0·060 had no effect. The markedly positive indolphenol dyes have only a slight effect or none at all. Certain other substances producing interference are also described. The redox-substances produce their effect by interfering with the sensitivity of the trypanosomes. The mode of action of these substances in relation to oxidation-reduction phenomena occurring in the cell is discussed.—J. M. R.

BERGER, E. (1937). Die Wirkung des Prontosils auf die experimentelle Streptokokkensepsis nach Wundinfektionen. [**The Action of Prontosil on Experimental Streptococcal Sepsis**].—*Klin. Wschr.* **16.** 53-55. 1 table. [10 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 301. Signed W. W. C. TOPLEY].

Working with a strain of haemolytic streptococcus that was sensitive to prontosil, and, when injected subcutaneously into mice, produced a local abscess followed by a fatal generalized infection, the author has studied the effect of the peroral administration of the drug on the course of the experimental infection. The bacteria, in varying doses, were injected subcutaneously. The prontosil was administered, by stomach tube, five hours later, and again on the 3rd, 4th and 5th days. Of 10 mice so treated after the injection of 0·3 c.c. of a 1 : 10 dilution of a 24-hours serum-broth culture of this streptococcus, 7 were surviving in apparent health on the 14th day. All of 10 controls were dead by the 3rd day. Of 10 mice so treated after the injection of 0·3 c.c. of a 1 : 50 dilution of culture, 8 were alive on the 14th day, while all of 10 controls were dead by the 5th day. In other experiments it was found that reducing the number of doses of prontosil administered reduced the the number of survivors.

[It seems a little doubtful whether the author is justified in his statement that this streptococcus, on subcutaneous injection into normal mice, produces abscess formation followed later by generalization, since 5 of 10 control mice injected with the larger dose, and 5 of 10 injected with the smaller dose, were dead within 24 hours. Of all 20 controls only 3 were alive on the 3rd day, and 1 on the 4th; so that abscess formation can hardly have been a frequent occurrence in the mice not treated with prontosil.] The author states that prontosil had no constant effect in limiting abscess formation.

HUNT, G. A. (1937). **The Use of Cutaneous Staphylococcus Lesions in Mice for the Evaluation of the Germicidal Activity of Disinfectants.**—*J. infect. Dis.* **60.** 232-237. 2 tables. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 511. Signed C. C. OKELL].

A method is described for estimating the therapeutic value of germicides. Skin lesions were produced in mice by the intracutaneous injection of an " invasive " strain of *Staph. aureus*. The germicide under test was injected at the same time as the injection of the staphylococcus and at intervals afterwards and the interference with the development of the lesion estimated by comparison with control mice receiving the injection of staphylococci without germicide. Among the germicides tested were chlor-iso-octyl-resorcinol, sodium ethyl mercuri-salicylate (" merthiolate "), metaphen, mercurochrome, oxyquinolin, chlorazene and hexyl-resorcinol. Of these none prevented the development of a skin lesion when given later than two hours after infection and none was able to shorten the time of healing once the lesion had been established. The disinfectants of the alkyl-phenyl and alkyl-resorcinol type and their halogen substitution compound prevented the development of skin lesions in most instances when administered at the site of infection not more than one hour following injection of the organisms. The organic mercury compounds were found to be slow in action and their effect could be reversed by washing the bacterial cells with saline or by washing them in H_2S solution.

SJOLLEMA, B., & SEEKLES, L. (1936). Zur Bedeutung des Magnesiums in der Calcium-Magnesium-Therapie der Gebärparese. [**The Importance of Magnesium in Ca/Mg Therapy of Milk Fever**].—*Dtsch. tierärztl. Wschr.* **44.** 504-505. [4 refs.]

The authors consider that the detailed observations of ZWILLINGER upon the action of Mg on the heart [*Klin. Wschr.* **14.** 1429.], incidentally provide support for their own recommendation made six years ago, to include Mg in the calcium treatment for milk fever.—H. H. GREEN.

POSTEL, W. (1937). Erfahrungen eines Praktikers bei der Therapie der Grastetanie und Gebärparese. [**Treatment of Grass Tetany and Milk Fever**].—*Tierärztl. Rdsch.* **43.** 147-149.

This paper describes the treatment of two cases of milk fever and three cases of grass tetany with " calcimagon ", a preparation of a sterile solution of Ca chloride and Mg chloride in the proportion of 40 : 15. It is injected (intraven.) and has no bad effects on the heart or on the endocrine system. In each of the cases described recovery was immediate and no relapse took place. In the grass tetany cases chloral hydrate was also given.—JAMES STEWART.

MORGAN, T. N. (1937). **An Analysis of the Action of Posterior Pituitary Extracts on the Uterus.**—*J. Pharmacol.* **59.** 211-221. 6 figs. [9 refs.]

This describes a series of experiments undertaken to analyse the actions of the posterior pituitary hormones on the uterus. The extracts employed were the oxytocic hormone and the pressor hormone, known respectively under the commercial names of " pitocin " and " pitressin ", or when in combination, as " pituitrin ". The experiments were carried out in the rabbit, some by means of a uterine fistula, others by naked eye inspection.

It was found that an injection of " pitocin " brought about contraction of the uterus, followed by a period of augmented activity. " Pitressin " on the other hand caused a transient initial contraction followed by a period during which

uterine contractions were entirely absent, the latter being attributable to a state of vascular spasm in the organ. " Pituitrin " produced a mixed effect. Its action is dependant upon the relative proportions of the oxytocic and pressor hormones which it contains.—C. DAVENPORT.

I. ANON. (1935). Lentin in der Tierheilkunde. [**Lentin (Carbaminoycholin-chloride) in Veterinary Medicine**].—*Merck's Jber.* **49.** 108-112.

II. HORVATH, E. (1937). Die Automatie des Pferdeuterus und deren Beeinflus-sung durch Lentin und Hypophysenextrakte. [**The Action of Lentin and Pituitary Extract on the Mare's Uterus**].—*Wien. tierärztl. Mschr.* **24.** 138-143.

I. This substance which stimulates tissues supplied by cholinergic nerves, is more active than acetylcholine ; it is stable and easily sterilized and is effective when given (orally or subcut.) ; it should not be given intravenously. It is useful in gastric disturbances as it stimulates the gastric secretion and movements ; the salivary secretion is also increased. Constipation and other intestinal conditions are relieved by the effect of lentin on intestinal movements and secretion. Lentin causes a fall in blood pressure but has no deleterious action on the heart. Lentin can be used in pyometra during the puerperium and in other uterine conditions as it stimulates the uterine muscle ; it should not be used during pregnancy.

II. The effects of posterior pituitary lobe extracts and of lentin on isolated strips of horse's uterus were investigated. Strips from non-pregnant animals show good spontaneous contractions and respond to small doses of both drugs. Strips from pregnant animals show less spontaneous motility and larger doses of posterior lobe extracts are necessary to elicit contractions.—J. M. ROBSON.

KARNEEV, N. E. (1936). O primenenii vodnich rastvorov chlorpikrina dlja lečenija éesotki. [**The Use of Chlorpicrin for the Treatment of Mange**].—*Sovyet. Vet.* No. 2. pp. 39-42. 1 table. [French summary].

K. immersed mange mites enveloped in a muslin bag in an aqueous solution of chloropicrin (temperatures up to 37°C.) for various periods of time. It was found that a 1 : 10,000 solution killed the mites in 1 minute, a 1 : 20,000 solution in 3 minutes, a 1 : 40,000 solution in 5 minutes, and 1 : 100,000 solution in 10 minutes, and a 1 : 200,000 in 30 minutes. These solutions had practically no toxicity for animals.

SABORIDO, J. (1936). Acção antirachitica do olea de capivara e de diversos oleos vegetaes (verificação anatomapathologica). [**The Anti-Rachitic Action of Certain Vegetable Oils**].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **7.** 191-202. 10 figs. on 5 plates. [1 ref.] [English summary].

Post-mortem examination of experimental rats showed that the addition to McCollum's diet of capibara fat, irradiated by sunlight or extracted with alcohol or ether, promoted normal ossification. Capibara fat melted by artificial heat would not prevent rickets.

The addition to McCollum's diet of Brazil-nut and caju-nut oils led to normal ossification, but when the oils of peanut, topinamber, sesame and soya-bean were added rickets occurred.

The experiments lasted over periods of one and two months.—J. A. PASFIELD.

FITCH, L. W. N. (1937). **Care in Drenching Sheep.**—*N.Z. J. Agric.* **55.** 42-43. 1 fig.

Attention is drawn to the fact that several cases of abscess formation of the mouth have come under notice as a result of the careless use of rough surfaced metal drenching guns. The mucosa is damaged and the drench of copper sulphate and nicotine sulphate appears to favour infection.—C. S. M. Hopkirk.

POISONS AND POISONING.

French, M. H. (1936). **Salt Poisoning of Fowls.**—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 25-27.

A note is contributed on this condition as evidenced in a local flock. An experiment was staged to determine the effect of varying the intake of salt. It was found that " salt exerts a very toxic action when fed in amounts greater than 2% of the total food intake ". The main clinical symptoms were loss of weight, loss of feathers, diarrhoea and leg-weakness. This latter may be but an expression of a generalized debility. The effect on egg quality produced by a diet rich in salt is also discussed. Transportability trials were made on the eggs and a salt-free diet effected a great improvement.—S. A. Evans.

Barondes, R. de R. (1936). **Selenium Toxicosis. The Etiologic or Causative Factor in Pellagra.**—*Amer. J. digest. Dis. Nutr.* **3.** 330-331. [8 refs.]

In view of the resemblances between certain symptoms of selenium poisoning in animals and pellagra in man (gastro-intestinal and nervous disturbances, actinic dermatitis, pigmented skin areas and garlic odour of breath) and the response of less than 70% pellagra cases to vitamin B_2 therapy, B. suggests detailed examination of soils and food in pellagrous areas for toxic substances as possible causative factors of pellagra.—Alfred Eden.

Smith, M. I., Franke, K. W., & Westfall, B. B. (1936). **The Selenium Problem in Relation to Public Health.**—*Publ. Hlth Rep., Wash.* **51.** 1496-1505. 2 figs. on 1 plate, 3 tables. [13 refs.]

Analysis of the urine of 127 persons representing 90 families in the seleniferous areas of America revealed that, in 92% of cases, Se was present in quantities from 2 to 133 micrograms per 100 c.c., thus affording proof of absorption of the metal. There was no definite association between ingestion of Se and certain vague forms of ill-health among the population.—Alfred Eden.

Stenn, F. (1936). **" Alkali Disease " – Selenium Poisoning.**—*Arch. Path.* **22.** 398-412. [Numerous refs.]

Selenium poisoning is prevalent in the North Central Plains of the U.S.A., and in certain cereal producing areas. The seleniferous strata occur in cretaceous and eocene formations and up to 100 p.p.m. Se have been found in them. The toxicity of the metal varies with the ionic state, selenites are more toxic than selenates and reduced Se is almost non-toxic. Soils containing more than 0·5 p.p.m. and vegetation, in which Se is associated with the protein fraction, containing more than 5 p.p.m. Se are dangerous.

The outstanding lesions of the disease are necrotic and degenerative changes in the liver accompanied by haemorrhages and secondary inflammatory reactions. Characteristic erosions of the ends of the weight-bearing bones and abnormalities of the hoofs are also found. Animals also show impaired growth, emaciation and severe anaemia. Fowls show a marked reduction in fertility and chicks are frequently hatched monstrosities. Chronic sufferers do not usually recover when moved from the toxic range. No human cases have yet been reported.—A. Eden.

Duncan, C. W., & Miller, E. J. (1936). **Results of Feeding Various Levels of Soil Containing Beryllium to Chickens, Dogs and Rats.**—*J. Nutrit.* **11.** 371-382. 6 tables. [13 refs.]

It is firmly believed that in many parts of North Michigan ingestion of the soil is injurious to the health of animals owing to the high percentage of beryllium in the soil in these areas. It was found that the soil contained 0·615% of beryllium oxide. A diet containing 30% of such soil was well tolerated by rats and did not predispose to any of the rachitic symptoms produced in rats by the feeding of 0·25% beryllium carbonate in a mixed diet. Chickens tolerated up to 50% and dogs up to 60% of the soil in their ration without any interference with their normal growth or reduction of the calcium or phosphorus content of their blood. These results, therefore, failed to verify the belief that the soil in North Michigan was injurious to the health of animals, since the amounts fed in the above experiments much exceeded those consumed by normal animals under natural conditions.
—James Stewart.

Newsom, I. E., Stout, E. N., Thorp, F., Jr., Barber, C. W., & Groth, A. H. (1937). **Oat Hay Poisoning.**—*J. Amer. vet. med. Ass.* **90.** 66-75. [3 refs.]

Serious losses of cattle fed on oat hay are reported. Within two hours of feeding the hay, 67 cattle had died with symptoms suggestive of poisoning by hydrocyanic acid. Chemical tests did not detect the presence of a cyanogenetic glucoside in the hay. Watery alcoholic and ether extracts were harmless for laboratory animals. By feeding the hay the condition was apparently reproduced experimentally in five steers, causing death in three. Hydrocyanic acid was detected in the rumen of two animals some hours after death. The hay did not produce symptoms when fed to sheep, rabbits or g. pigs. Weeds present in the hay – pigweed (*Amaranthus retroflexus*), Russian thistle, sunflower, sedge and wild morning glory – did not contain any cyanogenetic glucoside and were considered harmless. Proof of cyanide poisoning is far from satisfactory and the authors suggest the possibility of some undetermined poison which produces similar symptoms.—N. J. Scorgie.

Hendrickx, H. (1936). Empoisonnements par insecticides pulvérisés sur les arbres fruitiers. [**Poisoning of Livestock by Powdered Fruit Tree Insecticides (Arsenic)**].—*Ann. Méd. vét.* **81.** 468-473.

Three cows grazing under trees which had been sprayed with lead arsenate developed symptoms of poisoning after about a fortnight, during which time there had been no rain. One animal showed distress, inappetence and diarrhoea, but recovered within two days on being transferred to fresh pasture and the administration of purgatives and milk. The other two died after five days having shown signs of acute nervous derangement, tetany and dyspnoea accompanied by diarrhoea. *Post-mortem* examination revealed marked gastro-enteritis, fatty degeneration of the liver and broncho-pneumonia caused by the presence of food in the lungs. The possibility of grass tetany was eliminated. Chemical analysis revealed an approximate daily intake of 0·3 g. each of As and Pb. Two calves fed on milk from the above cows died after showing marked diarrhoea although there were no *post-mortem* lesions.—Alfred Eden.

Dahl, G. (1937). Noen undersøkelser angående toksisiteten av farvestoffet rhodamin. [**Toxicity of Rhodamin**].—*Norsk VetTidsskr.* **49.** 13-17. 4 tables.

Certain consignments of grain destined for animal foods are in Norway

stained with rhodamin to prevent their use for human consumption. In feeding experiments with such treated grain on pigs, rabbits and fowls undertaken by SLAGSVOLD there was no ill effect on the animals nor " taint " of their tissues. The lethal dose of rhodamin for mice of 20 g. live weight was found by D. to be 0·03 g. (subcut. or oral), whereas 0·003 g. daily in the food in 30 days did not seem to produce any disturbance.—GUSTAV NAERLAND (OSLO).

NIEMES, B. (1937). Una nueva modalidad en la intoxicación por los sorgos. [**Chronic Sorghum Poisoning in Cattle**].—*Rev. Med. vet., B. Aires.* **18.** 398-404. [11 refs.]

Although the toxic principle of *Sorghum vulgare* is HCN produced by the cyanogenetic glucoside " dhurrin ", symptoms of chronic sorghum ingestion differ from those of HCN poisoning. Exaggerated reflexes and incoordination of the hind limbs were the prominent features in an experiment conducted by N. from 1932 to 1934. There was a slight rise of temperature but appetite, defaecation and micturition were unaffected. One bull showed incoordination of all four limbs. On changing to pastures of early maize all the affected animals recovered within 20 days.

The calves of the affected cows, born six months later, exhibited complete paralysis and either died of starvation or were slaughtered. No reason is advanced for the discrepancy between these symptoms and those of poisoning by HCN. —J. PASFIELD.

TROUCHE. (1936). Intoxication d'un troupeau d'agnelles par suite d'une absorption abondante de ravenelles. [**Poisoning of Lambs by Wild Radish** (*Raphanus raphanistrum*)].—*Rev. vét., Toulouse.* **88.** 682-683.

Fifty lambs were allowed to graze in a field covered with wild radish and at nightfall one was dead. Another 5 died before morning and the rest of the flock were unable to rise. Autopsies carried out within two hours of death revealed the rumens full of undigested food and the muscles of the abdomen very congested. The tissues were quite yellow in colour. The lungs were normal in appearance, the liver rather friable, and the kidneys congested. The bladder was full of urine which had a high content of haemoglobin. No lesions were found in the heart.

T., the veterinary practitioner in attendance, is convinced that the deaths were due to the lambs eating an excess of the wild radish, which completely covered the field and was in an advanced state of florescence.—JAMES STEWART.

EMMEL, M. W. (1937). **The Pathology of Crotalaria spectabilis Roth Seed Poisoning in the Domestic Fowl.**—*J. Amer. vet. med. Ass.* **90.** 627-634. 1 fig., 1 table. [1 ref.]

E. conducted an experiment on 19 birds with regard to the blood picture and histopathology in poisoning by *Crotalaria spectabilis* and to endeavour to explain an anaemia he had encountered, this not having been observed by THOMAS [*V. B.* **5.** 383].

Whilst in the acute form of poisoning the outstanding *post-mortem* lesions are innumerable petechiae in the serous membranes, in chronic cases these petechiae are few or entirely absent, and the outstanding lesions are necrotic enteritis, anaemia, ascites, and atrophy of the spleen. In acute cases the blood picture remains practically normal, but in the chronic form changes due to anaemia are seen. A table gives the complete blood count in the 19 cases and 2 controls, the lowest erythrocyte count being 820,000 per c.mm. and the haemoglobin reading, 18 (Sahli). The *post-mortem* lesions and the histopathology are fully described, a prominent character being a cloudy swelling.—E. E. JELBART.

Cruz, W. O. (1936). Sobre o mechanismo de formação das hyperglobulias de origem toxica. [**On the Mechanism of Polycythaemia in Poisoning by Carbon Tetrachloride**].—*Mem. Inst. Osw. Cruz.* **31.** 349-355. 1 fig., 4 tables. [4 refs.] [English summary].

In a previous work it was shown that the administration of medicinal doses of carbon tetrachloride to subjects suffering from ancylostomiasis produces a considerable increase in the red blood corpuscles. This effect is also produced by oil of chenopodium but in a milder form. After prolonged anaesthaesia by chloroform and chlorotone similar effects are produced, and it was verified that there was an extraordinarily rapid increase of red blood corpuscles, 1 to 2 hours after the beginning of anaesthesia and the existence of a maximum rate for such increase, which is not surpassed despite new prolonged anaesthesia. It was noted that no such increase in the number of R.B.C. occurred when splenectomized dogs were similarly anaesthetized. It would appear thus that the principal factor, in the mechanism of polycythaemia of toxic origin lies in a splenic contraction placing a quantity of concentrated blood into the circulation. This is normally kept in reserve in the spleen.—W. L. Marshall.

Williamson, G. (1937). **A Veterinary Aspect of Gas Warfare.**—*J. R. Army vet. Cps.* **8.** 61-67.

W. considers that in Great Britain prophylaxis against gas attack is narrowed down at present to combating the " blister " mustard gas (dichlorethylsulphide), delivered by projectile or as a spray from the air. He thinks that while universal individual protection of animals seems impracticable, collective protection is feasible provided that there has been previous preparation. He pictures the problems likely to be faced in the safeguarding of animals, fodder and water, and shows broadly the measures necessary to prepare buildings to provide full protection, although, temporarily, any roof cover is better than none. His experience is that horses will withstand, over a comparatively long period, a foulness of atmosphere from want of ventilation, which would quickly prostrate a man. References are given to the detailed pathology and therapeutics of mustard gas poisoning and skin susceptibility. The use of bleaching powder as a neutralizing agent is described.—E. E. Jelbart.

PHYSIOLOGY.

Wilson, G. S., Minett, F. C., & Carling, H. F. (1937). **The Nutritive Value of Raw and Pasteurized Milk for Calves.**—*J. Hyg., Camb.* **37.** 243-253. 1 fig., 3 tables. [7 refs.]

Fifty calves from a tuberculosis-free and abortion-free Shorthorn herd were allocated alternately as they were born, into one or other of two groups, one of which was fed on raw milk and the other on pasteurized milk. Each animal received its mother's colostrum for three and a half days and then was put on the milk diet for eight weeks. They were fed morning and evening in measured quantities in strict relationship to their body weight. Hay was allowed *ad lib.*

At first a certain amount of trouble was experienced with scouring in the " pasteurized group " but this was traced to insufficient cooling of the milk immediately after pasteurizing. After this was corrected only slight scouring was observed in occasional animals in each group, and this the authors attribute to the system of pail-feeding.

Two weaklings died from causes unconnected with the diet, but the remaining

48 throve well and showed no signs of rickets or of anaemia. Each animal was weighed at weekly intervals and the average increase in weight over the 8-week period was practically identical in the two groups (53·72 lb. in the "raw group" and 53·86 lb. in the "pasteurized group"). At no time during the experiment was any observer, lay or professional, able to distinguish between the two groups of animals.

At the conclusion of the experiment both groups were transferred to normal diet and within two to three months were indistinguishable in size and condition from animals which had received a more generous diet from birth.—A. ROBERTSON.

ANON. (1937). **Milk and Nutrition.** pp. 67. 4 text figs., 4 figs. on 2 plates, 29 tables. [Numerous refs.] Reading: Nat. Inst. Res. Dairying. [4to] [2s. 6d.]

Controversy has for long raged round the question as to whether pasteurization seriously diminishes the nutritive value of milk. At the end of 1934 the Milk Marketing Board, in conjunction with various other bodies including the Medical Research Council and Government Departments, set up a special committee, called the Milk Nutrition Committee, to deal especially with this problem, and this report is the first publication of the committee. The points dealt with in the report are :–

(1) The effect of commercial pasteurization on the nutritive availability of the Ca and P of milk.

(2) The effect of commercial pasteurization on the biological value of the protein of milk.

(3) The effect of commercial pasteurization of milk on the following constituents :–(a) vitamin A and carotene ; (b) vitamin B complex, and (c) vitamin C.

(4) The effect of commercial pasteurization on the total nutritive value of the milk.

The results of the carefully designed and adequately controlled experiments carried out to investigate these points showed conclusively that pasteurization neither adversely affected the nutritive availability of the Ca and P in the milk, nor the biological value and true digestibility of the nitrogen content. As far as the vitamins were concerned pasteurization did not effect a loss of vitamin A but seemed to reduce the vitamin B and vitamin C contents. It is pointed out, however, that pasteurization *per se* is not alone to blame for all the loss of these vitamins.

Further reports of the committee dealing with other aspects of pasteurization will be welcomed.—JAMES STEWART.

I. POLTYREFF, S. S., TSCHEREDKOFF, W. N., GUREWITSCH, D. I., & EGOROFF, S. W. (1936). Zur Erforschung des Mechanismus der Erregung der Magendrüsen bei Pferden. I. Mitteilung. [**Stimulation of the Gastric Glands in the Horse. I**].—*Arch. wiss. prakt. Tierheilk.* **70.** 313-318. 3 tables. [7 refs.]

II. POLTYREFF, S. S., TSCHEREDKOFF, W. N., GUREWITSCH, D. I., & WYSSOTZKY. (1936). Die mechanische Reizung als Erreger der Magensaftsekretion des Pferdes. II. Mitteilung. [**Mechanical Stimulation of the Gastric Juices in Horses. II**].—*Ibid.* 319-321. 1 table. [10 refs.]

I. The authors succeeded in producing an artificial gastric fistula for the purpose of examining the quantity and quality of gastric juices. Their attempts to influence the production of gastric juices by psychological irritation – oats and hay were brought near the horse but the horse was not allowed to eat it – and by physiological irritation – the horse ate a small quantity of oats, which was immediately after taken away through the artificial fistula – were unsuccessful.

II. In another attempt the stomach mucosa was mechanically irritated by touching it with a rubber tube carrying some rough material. The quantity of gastric juices was increased by this stimulation by 100% but the quality was unchanged.—F. FREUDENBERG (BERLIN).

ORECHOWITSCH, W. N. (1936). Ueber die Regeneration der Leber bei Vögeln. [**Regeneration of the Livers of Birds**].—*Virchows Arch.* **297.** 480-484.

Removal through the flank of one-third to one-half of the livers of pigeons and hens was carried out and the process of regeneration studied by killing the birds at intervals up to 60 days after operation. Resorption of the injured liver tissue was at first marked, but five to six days after operation intensive growth took place and the liver soon regained its previous weight. In the majority of cases there was only complete regeneration of the left lobe, regeneration of the right lobe being weak, except in those cases where the left lobe was completely resorbed after operation.—J. A. NICHOLSON.

LANGDON-BROWN, W. (1936). **The Present Position of Endocrinology.**—*Brit. med. J.* October 17th. 772-774.

This is the first article of a series on endocrinology and gives a brief survey of the present conception of the endocrine system. The following conclusions are given :–

(1). The hormones are of 2 grades ; the first of complex chemistry, are formed by the anterior pituitary which uses them to stimulate or inhibit the secretion of the second chemically simpler grade by the other endocrine glands.

(2). To a large extent they are under the control of the diencephalo-pituitary apparatus.

(3). They are not entirely specific since the same basal chemical group can produce more than one biological effect and their activity is largely conditioned by the competence of the tissues to respond to them and they may give rise to either physiological or pathological effects.—R. ALLCROFT.

LAGERLÖF, N. (1937). Nyare ryska undersökningar över brunst och ovulation hos sto. [**New Russian Work on Oestrus and Ovulation in Mares**].—*Svensk VetTidskr.* **42.** 17-25. 2 tables.

It is admitted by Russian authors that artificial insemination in mares is very often unsuccessful, and that insufficient is known as to the time at which ovulation takes place in the mare, which has a long oestral period. MIRSKAJA and SAIZMAN, at the All-Union Institute for Artificial Insemination, Moscow, undertook investigations in order to throw more light on the physiological activity of the ovaries of the mare. The heat period was determined by " trying " mares to the stallion and the development of the Graafian follicles was studied by daily palpation *per rectum*.

On the first day of heat one follicle only was observed in 35 out of 39 mares examined, whereas two follicles were found in the remaining four. In one or two days the one of these developed rapidly, whereas the other remained the same size or regressed.

When the oestral periods were abnormally long, follicles did develop but very slowly.

On the first day of oestrus the size of the follicles ranged from 1-6 cm. in diameter, the majority, however, falling between 2·5-4·5 cm. and growing to about 5-6 cm. at ovulation. As some follicles were observed to be the same size on the first day of oestrus as on the day of ovulation, the growth rate did not serve

as an indicator of the time when ovulation took place, but merely predicted the intensity of the heat symptoms in that period. At the initial stages the follicles felt rather compact, but became more soft and fluctuating as the time of ovulation approached. This observation, according to the Russian authors, may serve as an indicator by which the time of ovulation may be predicted. In no case was double ovulation observed. Observations over series of heat periods showed that there was no regular order as to the ovary in which follicles developed.

In 56 cases observed the oestral period lasted from 2-11 days (average 5·6), 1-9 days (average 3·8) before and 1-3 days (average 1·8) after ovulation.

Experimental work on hormonal therapy is in progress, either to produce or to accelerate ovulation. It is said that in 90% of cases treated with prolan, ovulation took place within 36 hours.—Gustav Naerland (Oslo).

French, M. H. (1936). **A Preliminary Blood Survey of the Cattle on the Volcanic Regions in the Northern Province (Phosphorus and Haemoglobin).**—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 81-88. 2 tables.

A continuation of the general survey of the Territory. The blood organic P and Hb level were estimated in both native-owned and European cattle on the volcanic regions of the Northern Province. Normal inorganic blood P values were recorded for cattle grazing – both on plains and on hillsides. The Hb level is, however, lower in those grazing on hillsides than in plains cattle. The Hb level also falls below normal whenever the grazings get eaten out or when milk production is increased by grading up the zebu cows with European breeds. —S. A. Evans.

French, M. H. (1936). **Further Observations on the Growth Curves of Native Cattle.**—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 107-110. 1 fig., 2 tables.

Further observations were made on the normal seasonal liveweight changes in native cattle. Normally an increase takes place from the middle of the wet season (February) to a maximum value in June. Liveweights then fall owing to the poor quality and shortage of the grazings. With the commencement of the rainy season in December it would be expected that liveweights would increase, but instead they decrease for another six weeks whilst the cattle are consuming young green grass. This lag in the growth curve is attributed to (1) the soaking of the old fibrous herbage by rain which renders it still less palatable ; (2) loss of stomach contents resulting from the scouring action of the young grass ; (3) reluctance to consume old fibrous herbage when once the stock have tasted green grass, and (4) cold stormy weather which causes a greater expenditure of energy to maintain body temperature.—S. A. Evans.

TECHNIQUE.

Swift, H. F. (1937). **A Simple Method for Preserving Bacterial Cultures by Freezing and Drying.**—*J. Bact.* **33.** 411-421. 2 figs. [15 refs.]

S. reviews the various methods, including drying and freezing, which have been used for the preservation of the cultural, immunological, biochemical and pathogenic properties of bacterial cultures. He himself devised his first method in 1921 and recently another which is a modification of the first one employing CO_2 ice (–76°C.) instead of a salt-ice mixture (–6°C.). Both methods require a vacuum of less than 1 or 2 mm. of Hg until drying is complete and P_2O_5 as a desiccant. A special cork-insulated ice-box is illustrated with the desiccator

inside and pump connexions. The sealed desiccator is placed on a CO_2 ice-box and contains the concentrated culture suspensions in small tubes which are suspended in glycerol to which CO_2 ice is added as the freezing medium under negative pressure.

The appearance of correctly treated viable cultures is described. The tubes are satisfactorily sealed with picein or sealing wax above wool plugs. Storage of the tubes was preferable at room temperature rather than in the cold, as the latter may cause cracks in the seal.—C. V. Watkins.

Moorthy, V. N. (1937). **A Simple Method of Staining and Mounting Nematode Larvae.**—*J. Parasit.* **23.** 100-102.

The technique was devised for the study of changes in guinea-worm larvae in the body cavity of *Cyclops* and also for other larvae from the intestinal contents of fish. The larvae were placed in a fixative consisting of 8 g. of mercuric perchloride and 16 g. NaCl in 100 c.c. distilled water and by a described method were fixed in a fully extended condition. The stain used was methylene blue in diluted Giemsa stain made alkaline with liquor ammonia fortis. After staining the larvae are preserved in 2% formalin solution under sealed cover-slips.—C. H.-S.

I. Brown, H. C., & Broom, J. C. (1936). **Studies in Microcataphoresis. I. Technique.**—*Proc. roy. Soc.* Ser. B. **119.** 231-244. 2 figs., 6 tables. [Numerous refs.]

II. Broom, J. C., Brown, H. C., & Hoare, C. A. (1936). **Studies in Microcataphoresis II. The Electric Charge of Haemoflagellates.**—*Trans. R. Soc. trop. Med. Hyg.* **30.** 87-100. 4 figs., 3 tables. [16 refs.]

I. Describes the cell used, the method of determining its depth by the number of revolutions of the fine adjustment of the microscope required to focus the upper and lower plates, and the method of determining the level at which the fluid of the cell is stationary and not subject to induction currents between the fluid and the glass. It is considered that the determination of the sign of the charge of particles presents no difficulties, but the position is less clear as regards the calculation of the absolute magnitude of the charge. The article is very technical and should be consulted in the original by those interested.

II. For studying the electric charge of trypanosomes the authors used a medium of pH 7·2, consisting of one volume of physiological saline and three volumes of 4% glucose. *Tryp. melophagium* from the gut of the ked, and *Tryp. lewisi*, *Tryp. cruzi*, *Tryp. rhodesiense* and *Leishmania* from cultures all proved to be negatively charged, whilst trypanosomes from blood may be positively or negatively charged, and both positively and negatively charged organisms may be present in the blood of the same animal at the same time. No alteration in the sign of the charge occurred in some cases during serial passage for more than 30 generations. The sign of the charge of trypanosomes which reappear in relapses after apparent spontaneous recovery is the opposite of that carried by the original strain. An alteration of the host species may also change the sign of the charge of the trypanosome. Some evidence was obtained that positive and negative variants might differ both serologically and in their resistance to drugs.—U. F. R.

MISCELLANEOUS.

Yacoel, J., & Spitz, G. (1937). L'électrocardiographie et ses applications cliniques chez le cheval. [**The Electrocardiograph and its Clinical Appli-**

cation in the Horse].—*Rec. Méd. vét.* **113.** 14-22. 2 text figs., 5 figs. on 1 plate.

The scope of the article is fully indicated in the title. The value of the electrocardiograph in equine practice is explained and its further possibilities discussed, particularly the information which it may reveal of the effect of various forms of work on the animal. The author recounts the principle on which the instrument works and the source of the electromotive force on which its record depends. Details are given of the instrument employed by the author, together with the methods of restraint of the patient and the application of the electrodes. The charts of the reading of a normal heart are illustrated and explained and five tracings are then given of abnormal readings together with an interpretation.—C. D.

Olver, A. (1937). **The Relation of Animal Nutrition to Public Health in India.** —*Agric. Live-Stk India.* **7.** 133-140.

An inaugural address given before the Medical and Veterinary Research Section of the Indian Science Congress, 1937. An increased consumption of milk, eggs and other foodstuffs of animal origin is essential to the improvement of nutrition of the peoples of India. This necessitates better facilities for production, preservation, transport and marketing so that, in turn, stock-owners may be in a better position to undertake the cultivation of more and richer forage crops.

O. stresses the pressing need for research into the composition and conservation of the various forage crops available to stock in India. Mixed farming and the proper management of grass-lands must replace the present unsound system by which the raising of cereal grains or other cash crops is the main object of the farmer. The nutrition of the people is directly connected with the composition of the soil on which crops are grown. In this connexion examples are furnished of the role of mineral and vitamin deficiency in disease causation in India and in other parts of the world.—C. Davenport.

Stoppoloni, G., & Cardona, L. (1937). Alcune notizie sul camello. [**Notes on the Camel**].—*Azione vet.* **6.** 98-106. 2 figs., 1 appendix.

The authors deal with both the single-humped camel (dromedary) and the double-humped (bactrian) camel. They give notes on the palaeontology of the camel from Miocene and Pliocene ages. The camel and dromedary can interbreed and produce fertile progeny ; if the latter is the male the progeny is one-humped. The authors describe diseases to which camels are subject and emphasize the necessity for castration owing to the ferocity of the male during the breeding season. They give interesting anatomical notes and assert that the camel's resistance to thirst is not due to water storing cells in the rumen, but to the presence of enlarged salivary glands. In an appendix they describe characteristics of the camel as a working animal.—S. F. J. Hodgman.

OFFICIAL AND OTHER REPORTS.

South Africa. (1936). **Safeguarding the Health of Our Livestock. Annual Report of the Division of Veterinary Services.** [du Toit, P. J.]—*Fmg S. Afr.* **11.** 551-557. 7 tables.

This report reviews the activities of the research and the field staffs of the division during 1936. In the introductory notes the death of Sir Arnold Theiler, the founder of the Veterinary Research Laboratory at Onderstepoort is feelingly referred to. The scope of the research work was so wide that it is only possible

to refer to certain items. During the year a comprehensive report was published on the comparative pathology of the neoplasms in the Onderstepoort collection. A hitherto undescribed condition in cattle was discovered, the so-called " pink tooth " or porphyrinuria and evidence was found of its hereditary nature.

The work on animal nutrition and zootechnics was extended and the department of wool research extended its activities considerably.

The neurotropic virus vaccine for horse-sickness continued to be used with success but fresh strains were met with which could break down the immunity. These strains are being incorporated in the vaccine. No success attended the attempts to infect laboratory animals with the viruses of blue tongue and heartwater.

On the field side, a few outbreaks of swine fever occurred and were successfully dealt with. Consistent progress was made in the eradication of sheep scab and goat mange. Great concern was aroused by the discovery of dourine in the Western Province but an active eradication campaign was commenced.—E. M. Robinson.

Tanganyika Territory. (1936). **Annual Report of the Department of Veterinary Science and Animal Husbandry, 1935.** [Hornby, H. E.] pp. 155. 18 text figs., 19 figs. on 8 plates, numerous tables. Dar es Salaam : Govt. Printer. [fcp] [Shs. 6].

This report is submitted under the following five main headings :– I, Administration, II, Disease Control, III, Animal Husbandry, IV, Research, and V, Pasteur Research, Demonstration Farms, Grazing Tests, Soil Erosion, etc.

Field operations are carried out by a system of provincial units in charge of veterinary officers working through assistant livestock officers and native veterinary guards, who patrol their respective areas inspecting and reporting on the livestock within their circuits.

The department is directly responsible to the government for the welfare of the livestock of the Territory and for the improvement and development of all aspects of animal industry. The policy of the department continued as laid down in detail in the previous year, the main aims being as follows :–

(a) Disease control, particularly with regard to rinderpest and contagious bovine pleuro-pneumonia.

(b) Introduction of measures to bring about the better distribution of stock, including the development of the cattle trade and anti-erosion measures.

(c) Development of industries in animal products such as hides, skins and clarified butter.

(d) Research.

(e) Provision of demonstration farms for educational purposes.

Finance.—The expenditure of the department amounted to £39,867 and there was a revenue, potential and actual (potential = the value of biological products issued free to natives) of £10,755.

Notes are given under such headings as Livestock Census, Livestock Trade and Stock Routes, Hides and Skins, Clarified Butter and Ghee, etc.

Other sections of the report are dealt with separately in this *Bulletin*.

—S. A. Evans.

Tanganyika Territory. (1936). **Disease Control.** [Lowe, H. J.]—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 7-18. 2 figs., 4 tables.

In a broad sense it may be said that the major cattle diseases of the Territory were rinderpest, contagious bovine pleuro-pneumonia, East Coast fever and trypanosomiasis, and of these the first two were the most important.

Rinderpest.—A scheme for dealing with rinderpest in the Territory was approved by the Secretary of State during the latter part of 1935 on the following lines :–

(a) An uncontrolled zone to be left in the northern area.

(b) Outside the uncontrolled zone a belt of immunized cattle to be interposed between it and the stock areas to the south.

(c) Outbreaks to the south of the immune belt to be dealt with immediately they occur and to be eradicated.

45,751 double inoculations and 22,721 vaccinations were carried out by the field staff in dealing with rinderpest during the year. All these inoculations were carried out free of charge.

Contagious Bovine Pleuro-Pneumonia.—There were 110,000 head of cattle in quarantine for this disease at the close of the year. Lack of staff and rinderpest duties prevented the adoption of any organized attempt at eradication and, apart from some vaccinations of an experimental nature, quarantine alone was used to endeavour to prevent serious spread.

East Coast Fever.—There was no material change in the situation as compared with previous years. In most of the highland grass areas the disease is enzootic. In the semi-arid parts of the country infection is either absent or appears only sporadically. It is of interest that in several experimental movements and exchange of stock from one enzootic area to another there was no breakdown of acquired immunity in the animals concerned.

Trypanosomiasis.—In cattle *Tryp. congolense* and *Tryp. vivax* are the chief pathogenic organisms. *Tryp. brucei* is frequently harboured by these animals, but seldom causes ill effects. Several members of the native personnel are proficient in carrying out intravenous therapy. Reclamation work in tsetse-infected areas and further encroachment of " fly " in hitherto clean areas are reviewed.

Anthrax, Blackleg, Tuberculosis, Bovine Contagious Abortion, Foot and Mouth Disease, Redwater and Anaplasmosis, Heartwater, Cow Pox, Rabies, Skin Diseases, Helminthiasis, Contagious Pleuro-Pneumonia of Goats, Plant Poisoning and Myiasis are recognized and their significance discussed, and there are brief notes on diseases of equines, pigs, dogs and poultry.

Meat Inspection.—The inspection of the carcasses of 17,798 oxen, 28,023 sheep and goats, and 646 pigs comes under review. Out of 1,124 beef carcasses condemned, no less than 1,090 were seized on account of *Cysticercus bovis* infestation.

The above figures represent only a very small proportion of the total animals slaughtered for human consumption, as there are hundreds of small butcheries outside townships which only occasionally come under supervision. No cases of *C. cellulosae* in pigs were reported.—S. A. Evans.

Tanganyika Territory. (1936). **Report on the Work of the Veterinary Laboratory, Mpwapwa, 1935.** [Cornell, R. L.]—*Rep. Dep. vet. Sci. Tanganyika, 1935.* pp. 18-27. 4 tables.

Routine.

Anti-Rinderpest Serum and Vaccine Production.—All field demands were met, the actual issues from the laboratory representing 37,070 doses (40 c.c.) of serum and 29,550 doses (10 c.c.) of vaccine.

Morbid Specimens.—3,491 slides and specimens which included 608 blood samples for aggl. tests were submitted by the field staff and other outside sources.

Research Notes.

East Coast Fever.—A local tick survey, which was commenced the previous year, was continued in collaboration with Dr E. A. Lewis of the Kabete laboratory (Kenya).

Anaplasmosis.—A mild strain of *A. centrale* is maintained in calf reservoirs for immunization purposes.

Pyogenic Infection of Goats and Sheep.—A number of strains of pyogenic organisms were isolated from local flocks and their characters were studied. The characters agreed very closely with those of *Corynebact. ovis* though certain strains differed in fermentation reactions to some descriptions of this organism.

The incidence of Caseous Lymphadenitis is discussed.—S. A. Evans.

Federated Malay States. (1935). **Annual Report of the Veterinary Department for the Year 1934.** [Whitworth, S. H.] pp. 23. 1 table, 3 appendixes. Federated Malay States: Govt. Press. [8vo].

Straits Settlements. (1935). **Annual Report of the Veterinary Department for the Year 1934.** [Whitworth, S. H.] pp. 15. 12 tables, 1 appendix. Singapore: Govt. Printing Office. [fcp] [$1] [2s. 4d.]

Staff.—The organization remained unchanged with five Europeans in the F.M.S., and two in the S.S., in addition to the director of the combined services. There were also 16 Asiatic veterinary inspectors.

The expenditure in the F.M.S. was about $114,000 and that of the S.S. $70,000 whilst the corresponding revenue was $13,000 and $81,000.

Animal Diseases.—Thanks to the quarantine stations none of the serious stock diseases were imported. Haemorrhagic septicaemia occurred in Pahang and was quickly suppressed by isolation and vaccination. Tuberculosis was seen in one pig slaughtered at Kuala Lumpur. Trypanosomiasis was seen in six horses and in one dog. Contagious caprine pleuro-pneumonia killed off nearly all of a flock of goats in Pahang and Dog distemper was rife around Kaula Lumpur. Rabies was well under control and only one case was noticed.

At the Straits Settlements quarantine stations H.S. and F. & M. disease occurred being quickly suppressed. Two outbreaks of a disease resembling swine fever occurred around Singapore. S.F. has, however, not been conclusively proved to exist in Malaya.

Research.—Transmission tests were made with the blood of cattle in Pahang and an organism resembling *Babesia bigemina* was found in the test animals as well as *Anaplasma marginale*. A disease believed to be Fowl cholera was seen in turkeys and fowls in Taiping; it was passaged through other domestic birds, g. pigs and rabbits. The isolated organisms behaved in culture like a pasteurella, but not exactly like *P. avicida* as described in Europe. Another severe disease of fowls was investigated but not identified with any disease known elsewhere; a description is given and it is named "diphtheritic stomatopharyngitis".

Osteodystrophia and "dry coat" occur in horses in Malaya and dietetic tests were begun with the object of ascertaining its nature and finding means of prevention and cure.

General.—Information is given on animal husbandry imports and abattoir traffic.

The collective census for F.M.S., & S.S. was:- 292,600 cattle, 196,500 buffaloes, 252,000 sheep and goats and 559,000 pigs.—J. E.

Nyasaland Protectorate. (1936). **Report of the Veterinary Department for the Year ended 31st December, 1935.** [de Meza, J.] pp. 12. 1 table, 5 appendixes. Zomba: Govt. Printer. [fcp] [1s.]

STAFF.—Several changes took place. Mr. de Meza succeeded Col. TURNBULL as Chief Veterinary Officer and one new British Veterinary Officer was appointed. There were 4 British V.O.s, 2 British Stock Inspectors, 72 African assistants, 155 dipping tank labourers and 26 other Africans.

LIVESTOCK DISEASES.—It is claimed that Nyasaland is better equipped with dipping tanks than any other African territory. There were 61 government and 51 private tanks in use, and 3,757,000 native cattle and 101,800 European-owned cattle were dipped during the year with the result that there was little trouble from any tick-borne disease. *Tryp. vivax* and *Tryp. congolense* infections were controlled by chemotherapy. Other diseases that occurred are recorded in tabular form, also parasites which were identified.—J. E.

FRANCE. (1937). Extrait du rapport sur les travaux du laboratoire militaire de recherches vétérinaires pendant l'année 1936. [**Report of the Military Veterinary Research Laboratory, France, for 1936**]. [CARPENTIER].—*Rev. vét. milit.* **21.** 75-81.

This contains extracts from each of the four parts of the original report. [The original report is a confidential departmental document and these extracts give the only details available to the public].

Part I is devoted to short accounts of laboratory work undertaken during the year in connexion with EQUINE INFECTIOUS ANAEMIA, STRANGLES, FISTULOUS WITHERS associated with *Brucella abortus*, ANTHRAX, GLANDERS, and certain pyogenic infections. Part II deals with HELMINTH INFESTATIONS and RINGWORM. Parts III and IV, which each amount to a few lines only, refer to the identification of neoplasms and sundry laboratory examinations. The extract as published is too curtailed to be of any real value for reference purposes.—C. DAVENPORT.

FRANCE. (1937). Statistiques vétérinaires de l'armée pour l'intérieur, l'Algérie, la Tunisie, le Maroc et le Levant. Année 1935. [**Statistical Veterinary Report of the French Home and Colonial Army for 1935**].—*Rev. vét. milit.* **21.** 5-73. Numerous tables.

A lengthy report giving statistical details of the work of the French Army Veterinary Service for the year 1935. It is on similar lines to the reports of previous years and consists mainly of a series of tables dealing with every aspect of animal inefficiency from the military viewpoint. The total number of animals covered by the report is given as 117,512 which includes animals of the army stationed in France and those belonging to the troops in Algeria, Tunis, Morocco and the Levant.

In Part I are shown, by means of tables and graphs, (1) the number of animals in the army by ages, (2) the incidence of disease among them according to the official classification, (3) the duration of illness and the percentage death rate in the hospitals and remount depots of the army, (4) the total mortality rate in the 22 military districts, and (5) the cause of wastage under various headings and its relationship to age.

Part II is devoted to a more detailed consideration of certain features of the more important diseases. GLANDERS was non-existent. The incidence of STRANGLES is given at 6·17 ‰ with a death rate of 0·1 ‰, both showing a slight increase on the previous year. A slight decrease is recorded in the incidence and loss from TETANUS over the figures of 1934. There were 91 cases of EPIZOOTIC LYMPHANGITIS and 6 of ULCERATIVE LYMPHANGITIS, 6 of the former and 4 of the latter occurring in France. MANGE was met with in 41 animals, RINGWORM in 537. EQUINE INFECTIOUS ANAEMIA, which has been made the matter of a separate

report, is increasing. An analysis is given of the casualties recorded under the headings respiratory diseases, digestive apparatus, locomotory apparatus and wounds.—C. DAVENPORT.

GERMANY, PRUSSIA. (1936). Veröffentlichungen aus den jahres-Veterinär-Berichten der beamteten Tierärzte Preussens für die Jahre 1933 und 1934. [**Germany: Report of the Government Veterinarians, Prussia, for 1933 and 1934.**] [MÜSSEMEIER, & HOFFERBER]. [2 Vols.] pp. 181 and 448. Numerous tables and graphs, 17 maps. Berlin: Richard Schoetz. [4to].

This report is packed with detail and so can only be abstracted in general terms. Part I deals with notifiable diseases and Part II with other diseases, market and frontier control, abattoir statistics, veterinary legislation and with a special clinical investigation into equine infectious anaemia [see p. 597].

PART I (NOTIFIABLE DISEASES).

General figures relating to the several notifiable diseases, their incidence and the losses they cause are first given, followed by long reports on each.

STRANGLES was only notifiable in the Stade government district where 34 cases were seen in 1933 and 179 in 1934. ANTHRAX decreased in incidence and was only observed in an average of 360 cattle and 55 pigs during the two-year period; this was thought to be due to restriction placed on the importation of feeding stuffs and hides. Serum and vaccines of various kinds were widely used. 27 and 18 cases of human anthrax were seen in 1933 and 1934 respectively, 7 being fatal.

TUBERCULOSIS.—This section gives details of the working of the Ostertag voluntary control scheme, which by the end of 1934 extended to 261,721 herds with a total of 2,699,000 cattle.

The great majority of the herds were examined once during each year and some 37,000 cases of open TB. were detected in them in 1933 and in 1934. The reports of district veterinarians are freely quoted. Although the scheme causes a fall in TB. to a small percentage in enrolled herds, the disease never disappears, hence many reporters recommended the adoption of an eradication scheme based on the tuberculin test, the slaughter of reactors and the building-up of fresh clean herds. The tuberculin test only confuses matters when added to the Ostertag scheme.

SWINE ERYSIPELAS was very severe in the autumn in each year, being present in 25,000 centres and affecting 37,000 pigs. In some districts the farmers have been financially assisted in the immunization of their pigs. The use of large doses of serum given by various routes to individual pigs and of "rephrin" yielded successful results. Figures on the state testing of antiserum are given. Numerous cases of S.E. in man are mentioned. GLANDERS was seen in 25 horses and 3 circus hands. Some details of serological diagnosis are given. HAEMORRHAGIC SEPTICAEMIA in 2 horses is reported. FOWL CHOLERA occurred in 130 places in each year, several hundred head of poultry having died. About 400 cases of BLACKLEG occurred each year.

FOOT AND MOUTH DISEASE had practically disappeared from Prussia by the end of 1934, only 52 new cases occurring in that year. Examples of some "recovered carriers" are given, the longest period exceeding 2 months. Serum prophylaxis was employed to deal with outbreaks. GENITAL VESICULAR EXANTHEMA ("Bläschenausschlag") occurred widely, but not seriously, in cattle and slightly in horses – except for a bad outbreak around Wiesbaden in 1933.

SWINE PLAGUE AND SWINE FEVER.—[These are reported upon jointly – see *V. B.* **6.** 465, 466, 491 and 770]. The incidence of both conditions showed a

slight fall from the previous biennium, but 740 places were affected in 1933 and in 536 in 1934, with an average mortality of 82% in the two years, involving 5,000 pigs in 1933 and 3,200 pigs in 1934. Several notes on differential diagnosis are given by district veterinarians. RABIES showed an increase, being rather wide-spread; it was diagnosed in 185 dogs, 5 cats, 7 horses, 80 cattle, 1 sheep, 1 goat and 1 pig during the period. FOWL PLAGUE was not seen in 1933 and occurred on only one farm in 1934.

EQUINE MANGE occurred in 527 horses during the period. Sulphur dioxide gas treatment was chiefly used and an ox warble derris preparation also gave good results. BOVINE MANGE is only notifiable in the government district of Aurich where it occurred in 8 places during the period. Derris was successfully used for its eradication. There was a great increase of SHEEP SCAB as compared with 1931-1932. 78 farms and 6,000 sheep were affected in 1934. A large-scale examination of sheep farms took place and 38 and 32 infected farms were found in the 2 years respectively. Energetic treatment by dipping or hand dressing controlled the outbreaks. Several preparations were used, mostly lime-sulphur baths.

PART II.

EQUINE DISEASES.

EQUINE INFECTIOUS ANAEMIA showed a slight decrease compared with the previous period, being observed in 217 districts and in about 800 horses in 1933, and in 500 in 1934. Compensation is paid for loss. Changes characteristic of E.I.A. were observed in the liver, spleen and kidneys of an eight-months foetus of a mare destroyed on account of the disease. BORNA DISEASE was seen in only 5 government districts and 20 horses were destroyed on account of it in the period. Some results of vaccination are given; they were not very impressive.

Brief reference is made to EQUINE INFLUENZA [? " pink-eye ", influenza catarrhalis], CONTAGIOUS PNEUMONIA [influenza pectoralis, " Brustseuche "], INFECTIOUS BRONCHITIS [" Hoppegarten cough ", influenza pulmonalis], EQUINE BRUCELLOSIS, TETANUS, PERIODIC OPHTHALMIA, INFECTIOUS ABORTION, STERILITY and JOINT-ILL.

BOVINE DISEASES.

BOVINE CONTAGIOUS ABORTION.—The true extent was unknown. Many reports of human *Br. abortus* infection are given. MASTITIS.—A voluntary control scheme was in operation towards the end of the period, several reports of early experiences with it being given.

BLINDNESS IN YOUNG BULLS.—Several young bulls of piebald lowland breed became blind over a short period, the condition being due to atrophy of the optic nerve papilla. The cause was not determined, some suspicion being laid on in-breeding.

Notes are also given on many other bovine diseases.

SHEEP DISEASES.

A brucella organism was isolated from the foetus of one of 8 ewes which aborted. Two outbreaks of gangrenous mastitis and several of Borna disease are also reported.

PIG DISEASES.

Several reports are given on PIGLET INFLUENZA which was observed in 10 government districts. *Br. abortus* was found in six sows which had aborted. One reporter recorded 2 outbreaks of *Salmonella cholerae-suis* infection. The clinical differences between this and swine erysipelas and anthrax are given. SYNCOPE of pigs occurred in many districts and was believed to be due to protein poisoning.

The pigs, usually well fattened, are either found dead or die after a few minutes of acute distress. Heart muscle degeneration is the chief *post-mortem* finding. One reporter suggested that gastric distension with sloppy food was a cause. Rhinitis (" Schnüffelkrankheit ") was common in one district. It is said that daily dosage with iodine is useful prophylactically. An Enzootic Hepatitis which responded to cod liver oil therapy was seen in some districts.

Fowl Diseases.

Short notes are given on TB., Pullorum Disease, Fowl Pox and Fowl Paralysis. An outbreak of Psittacosis occurred at Cologne and a few cases elsewhere, the avian virus carriers being destroyed.

Parasitic Diseases.

The incidence of Ox Warble Flies varied greatly in different parts of Prussia. The progress of the campaign is described. " Derrilavol " gave good results in the destruction of warble larvae. Anaphylaxis following derris treatment is described in detail. Several cases of injury and death in cattle from attacks by Midges are reported. Bovine mange occurred in some districts and was successfully treated with derris. Some individual reports are given on Sclerostome Worms in horses against which tartar emetic was used intravenously. Fascioliasis occurred, also Lungworms and Stomach Worms of cattle and sheep.

Poisoning.

Case records are given of the poisoning of animals by arsenic, lead, smoke from metal works, potash, common salt, lithopine (a painter's white colour composed of zinc sulphide and barium sulphate), phosphorus, saltpetre, herring brine, alcohol, calcium cynamide, mouldy food, soya bean meal, potatoes, yew, water hemlock, a type of scurvy grass (*Cochlearia armoracia*) and nicotine.

Nutritional and Sporadic Diseases.

The Prussian Minister of Agriculture ordered a special enquiry to be made into the extent of bovine lymphadenosis and the results are here given. It was prevalent in 8 government districts. Symptoms and *post-mortem* lesions are described in detail. Cases of lymphadenosis in pigs were also reported. Osteodystrophia and pica were observed in many parts. A deficiency disease of sheep which had caused severe losses for many years on a large farm is described. The lambs (but not the ewes) first showed lachrymation, the wool fell away and more or less rapid emaciation followed without loss of appetite. Lambs transferred to other farms grew well. A calcium preparation effected a cure in lambs not yet severely affected.

A rapidly fatal disease of unknown causation in cattle on moorland is described.

General Veterinary Affairs.

Notes are given on horse-shoeing, knackeries, dairies, cattle markets, trade in livestock, frontier traffic in livestock, animal breeding, drug dispensing, quackery, and animal protection against cruelty. A long chapter is devoted to the duties and remuneration of veterinarians in state service.

Public Health – Meat Inspection.

Information of a general nature is given.—J. E.

Sweden. (1937). Det civila Veterinärväsendet år 1935 av kungl. Medicinalstyrelsen. [**Report of the Civil Veterinary Service for 1935**]. [Frykholm, N.] pp. v + 46. 34 tables. Stockholm: P. A. Norstedt & Söner. [4to] [French summary].

The distribution of veterinary surgeons in Sweden remained as in the previous year.

Diseases of Animals.

Anthrax.—The incidence was almost as in previous years, 54 deaths being reported. Bovine Tuberculosis.—252,220 cattle in 14,939 herds were tested with tuberculin, the reaction being negative in 5,914 herds. Out of 48,353 cattle over 2 years old, 9,459 between 1 and 2 years, and 10,089 calves tested with tuberculin for the first time, 11·6%, 12·1%, and 5·4% respectively gave positive reactions. Control tests on 125,443, 29,844, and 29,021 head of cattle in similar age groups, but in herds protected against TB. [by rational segregation etc.], showed an infection incidence of 2·1%, 1·9%, and 1·3% respectively. A table is given of the results of tuberculin tests in Sweden from 1897 to 1935. 117,602 cattle in 4,877 herds were clinically examined for TB. 3,848 of these were slaughtered on account of open TB., 215 on account of udder infection and 307 on account of TB. in the genital organs. *Brucella abortus* Infection.—About 2,000 herds containing about 9,700 animals were infected. Contagious Equine Abortion.—16 studs were infected. Blackleg caused the death of 21 head of cattle.

Foot and Mouth Disease and Swine Fever.—No cases were reported. Equine Infectious Anaemia was diagnosed in 656 cases. 439 horses were slaughtered. The campaign against the disease in Norrbotten province was carried out by a special commission in 1935. The systematic use of liver puncture for the collection of material for microscopic examination has been continued and the diagnostic results are very good.

Food Control.

There are eight public abattoirs in the largest towns of Sweden. In addition there are 122 communal meat inspection centres (8 new this year), and 36 control abattoirs. Statistics are given.—H. Berthelsen (Stockholm).

Great Britain. (1937). **Report of Medical Research Council for the Year 1935-1936.** pp. 172 + xii. 1 appendix. London: H.M. Stat. Off. [8vo] [3s.]

The report is divided into the following main sections :- (1) an introduction, describing briefly the general nature of the research work covered; (2) the work of the National Institute of Medical Research; (3) the Determination of Biological Standards and the Methods of Biological Assay and Measurement; (4) Clinical Research Units; (5) External Research Schemes; (6) Industrial Health, and (7) Travelling Fellowships. The composition of the Investigation Committees for Special Subjects is given in an appendix.

A grant-in-aid of £165,000 was voted by Parliament during the financial year, £9,500 being allocated to administrative and travelling expenses of the Council, £58,500 for the National Institute for Medical Research at Hampstead, and the farm laboratories at Mill Hill, and £97,000 for research grants to scientific work elsewhere. Important additions to this public monetary grant were received from other sources.

The National Institute for Medical Research.

Influenza.—Evidence has been obtained as to the world-wide diffusion of this virus. Infection from a human source which has been repeatedly passed from ferret to ferret has been retransmitted to man. Progress has been made in the study of methods for the immunization of man against influenza.

Dimensions and Properties of Viruses.—Information is given of a new method of ultra-centrifugation designed by the late Dr M. Schlesinger. By this method fluid containing the virus of foot and mouth disease can be freed almost

completely from its infective properties in five minutes. Dimensions of infective particles of viruses have been calculated by this method and it compares well with the method of differential filtration.

Relation of Viruses to Host Cells.—Light in the presence of methylene blue was used as an antiviral agent to determine how long it takes a virus to become intracellular and thus become protected against agents which can attack it. Fowl plague virus was found to become protected in one hour, while that of vaccinia required 10 hours and that of herpes 18 hours.

Transmissible Tumours.—Results of work on tumours in birds produced by injection of tar solutions are difficult to explain unless the presence of a virus-like agent is accepted.

Vesicular Stomatitis and Foot and Mouth Disease.—Further study of these viruses has been made possible by important advances in microscopy and optical methods. Observations are being prepared for publication.

Johne's Disease.—Experiments, using goats, are in progress with a view to ensuring that preparations of "johnin" are of uniform potency.

Chemotherapy.—An arsenical derivative, neocryl, which gives promising curative results in experimental trypanosomiasis, is now being tried on human patients.

Endocrinology.—Investigations were continued on the interrelated actions of a number of hormones, the anomalous occurrence and actions of certain hormones and on antihormones.

The Institute's programme included research work on many other subjects. A list of publications during the year is given at the end of the section.

External Research Schemes.

A very wide range of subjects was studied at outside institutions with the help of monetary grants from the Council. The following points are of veterinary interest :– At Sheffield, King found that vitamin A deficiency resulted in abnormal development of calcified dental tissues and in retarded tooth eruption which, in dogs, caused malocclusion of the teeth. At Cambridge, Buxton, Glover and Griffith carried out further experiments in the immunization of calves with BCG, and Griffith also studied the bacteriological characteristics of tubercle bacilli of human and animal origin. Enquiry was continued by M. H. Gordon into the aetiology of lymphadenoma, with special reference to the significance of the minute "virus bodies" which occur in the lymph node in that disease. Reference is made to work carried out by G. S. Wilson, which resulted in the adoption by the Ministry of Health of the modified methylene blue reduction test for raw graded milk in the Milk (Special Designations) Order, 1936.

At the Institute of Agricultural Parasitology, St. Albans, experimental work on the prevention and treatment of worm infestations was continued, and included inquiry into the effects of various foods and drugs on *Heterakis* and *Trichostrongylus* infections of fowls.

Travelling Fellowships.

Methods of eradicating bovine tuberculosis in Canada, the United States and several European countries were examined by G. B. Brook, under a Dorothy Temple Cross Research Fellowship in Tuberculosis.—J. C. Wallace.

–. (1936). **3rd International Congress of Comparative Pathology, Athens, April 15-18, 1936. First Volume. Reports. Part 1. Section of Human Medicine and Veterinary Medicine. Part 2. Section of Plant Pathology. Second Volume. Proceedings and Communications.** pp. 394 + 198, 276

and 662. Numerous figs. and tables. [Numerous refs.] Athens : " Eleftheroudakis " Co. [8vo] [In English, French, German, Spanish and Italian].

The congress was supported by many nations from all parts of the world and the discussions were on numerous subjects with greatest attention paid to diseases of animals and man of the warmer temperate regions – leishmaniasis, spirochaetosis, echinococcosis, pox infections, avitaminoses, etc. The veterinary section also discussed anaerobic diseases.

All papers of veterinary interest are dealt with in this *Bulletin*.—J. E.

I. Great Britain. (1936). **Thirty-Fourth Annual Report, 1935-1936, of the Imperial Cancer Research Fund.** [Gye, W. E.] pp. 43. [Numerous refs.] London : Imperial Cancer Research Fund. [4to].

II. Great Britain. (1936). **Thirteenth Annual Report of the British Empire Cancer Campaign Presented at the Meeting Held at the House of Lords 23-11-36.** pp. xxvii + 335. 6 figs., numerous tables, 17 maps. [Numerous refs.] London : British Empire Cancer Campaign. [4to].

I. As a result of experiments with transplantable tumours, it would appear that fluctuations of growth rate and of successful transplantation depend largely on individual susceptibility ; by selective breeding it is possible to obtain an increased susceptibility to tumour transplants in general.

Substances which arrest mitosis in cancer cells have a similar action on normal cells, to such an extent as to preclude their therapeutic use.

Carcinogenesis, as a result of " thorotrast " or oestrogenic hormone treatment, has been studied. The latter substance, repeatedly applied to the skin of mice, produces a cancer of the mammae, but not of the skin, in both sexes ; changes also occur in the endocrine glands. Strains of mice susceptible to mammary cancer do not show a similar increased susceptibility to skin cancer ; on the contrary there is some evidence of antagonism.

The virus of rabbit papilloma has been examined, and the transition from a primary benign to a malignant tumour confirmed. The virus has successfully been re-inoculated only from the benign tumour ; it seems to become non-infective when malignancy supervenes.

Filtrable tumours in the fowl have been compared to those produced by dibenzanthracine applications. Filtrates of the latter type of tumour, although inactive on inoculation, appear to contain an antigen present in filtrates of Rous sarcoma, in so far as when they are inoculated into rabbits an immune serum is produced which will neutralize active Rous sarcoma virus.

The effect of radiation on cell respiration and glycolysis, and on glyoxalase, is discussed.

II. The investigations made by the institutions and individuals to whom grants have been made are reported, and the reports are edited and summarized by J. P. Lockhart-Mummery. The following points show the trend of the investigations :– (1). The cancer cell is a normal cell that has undergone metabolic changes ; these changes appear to be permanent and irreversible. (2). As a result of experiments on the growth rate of cancers in mice, the evidence suggests that tumours originate from a single cell. (3). The carcinogenicity of a mineral oil has been found to vary directly with its refractivity ; the higher the refractivity the greater the cancer-producing power. (4) Cancer cells do not continuously permeate the lymph vessels ; emboli of cancer cells are conveyed rapidly to a lymph node, and the spread occurs from node to node. " Thorotrast " has been used to study the distribution of lymphatic vessels. (5) In their metabolism, cancer cells differ from normal body cells in that they have a very high aerobic

fermentation. It appears that a combination of aerobic glycolysis with a lowered carbohydrate oxidation (as shown by a lowered respiratory quotient), is peculiar to tumour tissue. (6). Colchicine, and substances of similar molecular structure, arrest cell division in the later stages of mitosis, but their effect seems to be superficial and local. (7). In addition to fowl tumours such as the Rous sarcoma, filtrable agents have now been identified in Shope's rabbit papilloma, and in a mouse sarcoma. Such filtrable agents appear to be particulate, and resist freezing at −191°. (8). Experiments to produce a precancerous condition in the rat's stomach by feeding with *Gongylonema neoplasticum* infected cockroaches have failed, and cervical lacerations or chronic cervicitis do not appear to be precancerous factors in cancer of the cervix uteri in women. (9). With the Jensen rat sarcoma, when regression of a tumour occurs, " antibodies " can be detected in the serum, unusual in that they do not appear to be specific to a single species of tumour. (10). Improvements in the use of radiations, and the value of short wireless waves are discussed. (11). Clinical problems, cancer distribution in England and Wales, and the rapid increase of cancer of the lung and larynx are considered.—Norman Hole.

BOOK REVIEWS.

Voss, H. J. [Dr. Med. vet. habil., Medizinische Universitäts-Tierklinik, Leipzig]. (1937). Die Zahnfachentzündung des Pferdes. Hämatologisch-minimetrische, klinische, röntgenologische und histologische Betrachtungen. [**Periodontal Disease in the Horse**]. pp. iv + 112. 21 text figs., 1 fig. on 1 plate. [Numerous refs.] Stuttgart: Ferdinand Enke. [8vo] [RM. 14].

This is an extensive review on what is conveniently called periodontal disease, which embraces affections of the tissues surrounding the tooth, and may be used for slight or severe cases involving merely the alveolar wall or the jaw bone as well.

The subject is considered under the following headings :– anatomy, aetiology, pathogenesis, diagnosis, incidence, haematological tests, clinical aspects, X-ray examination and pathology. In each chapter the literature is reviewed and the author's own observations given, but he fails to draw any definite conclusion throughout, and there are no summaries of any kind so that the reader, having read a chapter with the necessary great concentration, is merely left with a mass of rather indigestible facts without any clear-cut deductions.

The haematological section is particularly weak in this respect, as V. says that much of the material was obtained from out-patients, which cannot, therefore, have been given an exhaustive diagnostic examination. The data secured are therefore without significance for periodontal disease *per se*.

The X-ray section is of little practical clinical value, as the pictures were obtained on dead and apparently boiled out jaws. [The use of X-rays in practice for the examination of the teeth – involving the administration of a general anaesthetic – is only possible in a few lavishly equipped clinics].

V. has not concerned himself with the broader problems of occurrence according to breed (including wild horses, farm horses and town horses) or diet, or with prevention and treatment; perhaps, having laboured thus far, he will complete the work and give us a larger and more inspired book in the future.

The printing and illustrations of the book are very good.—J. E.

Richter, J. [Dr. med. vet. et phil., ord. Professor der Tierzucht und Geburtskunde an der Universität Leipzig]. (1937). Die Schwangershaftsdiagnose beim Rind. [**Pregnancy Diagnosis in Cattle**]. pp. 71. 19 figs. [Numerous refs.] Berlin: R. Schoetz. [8vo] [RM. 3].

This little book ranks as a third revised edition of an earlier book by a veterinary practitioner named Anton Zieger.

After introductory chapters on the anatomy and physiology of the genital tract in cattle, the technique of clinical diagnosis is described, being followed by a series of ten chapters, each devoted to the condition of gestation and its detection in each of the ten months of pregnancy. Accessory methods of diagnosis, including hormonal tests, are dismissed in a few lines, since in cattle, diagnosis by such means is only possible late in pregnancy. There should be no difficulty in making a clinical diagnosis after studying this excellent guide, which contains an adequate number of good figures.—J. E.

Anon. (1937). **Hygiene in the Bacon Factory.**—*Bull. Bacon Developm. Bd, Lond.* No. 1. pp. 32. 3 photographs. [3 refs.] [1s.]

A useful booklet dealing with the construction and maintenance of bacon factories to the required hygienic standards, with special reference to conditions imposed for the granting of bacon traders' licences by the Bacon Development Board.—J. E.

Currie, J. R. [Henry Mechan Professor of Public Health, University of Glasgow]. (1936). **Laboratory Practice.** pp. xix + 378. 169 text figs., 31 tables. Edinburgh: E. & S. Livingstone. [8vo] [21s.]

This book is written essentially for the Public Health worker, and covers a very wide field. Water, air, foodstuffs, beverages, preservatives and disinfectants are dealt with from chemical, bacteriological, protozoological and entomological aspects, and the diagnosis of specific infections such as tuberculosis and anthrax is also considered.

The book is freely illustrated and clearly written.—Norman Hole.

Chitwood, B. G., & Chitwood, M. B. (1937). **An Introduction to Nematology. Section I. Part I.** pp. 53. 53 figs. [Numerous refs.] Baltimore, Md.: Monumental Printing Co. [4to].

This publication should be useful to all who specialize in helminthology although it is principally written for the taxonomist and is to be a comprehensive treatise on nematology, written from a strictly zoological point of view, wherein it differs from the several books which have recently appeared on the economic, medical and veterinary aspects of the subject.

The subject will be dealt with in three parts, the first dealing with anatomy, the second with ontogeny and the third with taxonomy and will be dealt with in a series of ten numbers.

The presentation of the matter is good and the illustrations are excellently reproduced although most of them have been borrowed.—E. L. Taylor.

AUTHOR INDEX, 1937

A

Abelein, 325.
de Abreu Martins, I. See Alves de Souza, M., jt. author, 471.
Ackert, J. E., 542.
—, & Reid, W. M., 183.
—. See also Freeman, A. E., Jr., jt. author, 610.
Adair, M. E. See Greves, R. I. N., jt. author, 448.
Adams, A. R. D., 522.
Adamson, J., Jr., 241.
Adler, S., 588.
—, & Ellenbogen, V., 167.
Adsersen, V., 484.
Africa, C. M., Refuerzo, P. G., & Garcia, E. Y., 387.
Aggarwala, A. C. See Nagakura, Y., jt. author, 450.
Aitken, R. S., Barling, B., & Miles, A. A., 322.
Ajello, L., 370.
Akazawa, S., 534.
Albert, A., 399.
Albiston, H. E., 112.
—, & Talbot, R. J. de C., 366.
Aleksandrov, B. A. See Friedman, A. P., et al., jt. authors, 115.
Alessandrini, A., & Dominici, D., 368.
Alexander, A., 145.
Alexander, R. A., 227, 599.
Alexander-Jackson, E., 55.
Ali, M. See Sandiford, B. R., et al., jt. authors, 351.
Alibrandi, A. See Solarino, G., jt. author, 332.
Alicata, J. E., 538.
Almasy, F. See Krupski, A., jt. author, 631.
Alpe, F. T. See Ruddock-West, T., jt. author, 362.
Alves de Souza, M., & de Abreu Martins, I., 471.
Amman, K., 127.
Amundsen, H., 32.
—, & Okland, F., 24.
—. See also Holth, H., jt. author, 54.
Ananiadés, B., & Débonera, G., 521.
Ancelot, A. See Launoy, L., et al., jt. authors, 218.
Anderle, R., & Eberle, J., 239.
Anderson, E. B., & Meanwell, L. J., 490.
Anderson, E. O. See Plastridge, W. N., et al., jt. authors, 311, 312.
Anderson, G. W. See Johnson, E. P., jt. author, 210.
Anderson, J., 88.
Anderson, J. F. See Holm, A., et al., jt. authors, 287.
Anderson, R. J., Crowder, J. A., Newman, M. S., & Stodola, F. H., 56.
—. See also Crowder, J. A., et al., jt. authors, 56.
Anderson, W. H. See Cory, E. N., et al., jt. authors, 441.
Andersson, A., 129.
André, R. See Tzanck, A., jt. author, 25.
Andrews, C. H. See Elford, W. J., jt. author, 381.
Andrews, F. N. See Phillips, R. W., jt. author, 141.
Andrews, J., & Miller, F. W., 325.
—, & White, H. F., 163.
Andrews, M. N., 417.
Andrews, W. H., 92.
Andrijewski, P., 238.
Andrucci, M., 584.
de Angelis, E., 568.
Anido, V. See Basnuevo, J., jt. author, 609.
Aplington, S. P. See Falk, C. R., jt. author, 354.
Apostoleanu, E., & Vladutiu, O., 623.
Arayci, E. See Kolayli, C., et al., jt. authors, 392.
Arey, L. B., 393.
Argun, T., 447.
Arkina, R. See Friedman, A. P., et al., jt. authors, 115.
Armand-Delille, P. F., 260.
Armitage, F. D., 494.
Aron, M., 100.
Arroyo, C., & Campos, R., 549.
Arroyo, M. C., 531.
Artjuch, E., 121.
Artjuch, E. S., 335, 387.
Asche, H., 352.
Ascoli, E. W., 540.
Ash, R. P. See Stuart, C. A., et al., jt. authors, 236.
Askew, H. O., 349.
—, & Dixon, J. K., 84, 485, *bis*.
—. See also Kidson, E. B., et al., jt. authors, 495.
de Assis, A., 63.
Aston, B. C., 43.
Austin, K. M. See Mackerras, I. M., et al., jt. authors, 382.
Austin, L. D. C. See Wolff, E. K., jt. author, 254.
Avelange, 134.
Azinov, S. A. See Michin, N. A., jt. author, 419.

B

Babic, I., 75, 385.
Bablet, J., Ducourtioux, M., & Bloch, F., 410.
—. See also Bertrand, I., et al., jt. authors, 571.
Babudieri, B., 55, 339.
Bachrach, M. D., & Briskin, N. I., 235.
Badami, B. K., 559.
Badenski, G. See Ciuca, M., et al., jt. authors, 9.
Baeckmann, K., 509, *bis*.
Bahr, L., 159.
Bailly, J. See Remlinger, P., jt. author, 74, 175, 423, *bis*, 424, 471, 529, *ter*.
Baker, D. D. See Hinman, E. H., jt. author, 230.
Bakker, S., & Soeparman, R., 10.
Bakotic, L. See Hupbauer, A., jt. author, 634.
Baldacci, E., 323, *bis*.
Baldwin, E., 564.
Ball, V., 30.
Balmus, P. See Slantineau, A., et al., jt. authors, 417.
Balog, P., 397.
Balozet, L., 72, 113, 276, 335.
—, & Pernot, P., 323.
Balteanu, I., Toma, A., & Garaguli, A., 155.
Bang, B., 98.
Bang, F., 437.
Bang, O., & Jepsen, A., 104.
Barber, C. W., 626.
—. See also Newsom, I. E., et al., jt. authors, 641.
Barbieri, G., 474.
Barboni, E., 108.
Barcroft, J., & Barron, D. H., 446.
Bardach, M. See Wollman, E., jt. author, 101.
Bardach, N. See Goret, P., et al., jt. authors, 392.
Bardelli, P., 401.
—, & Menzani, C., 250.
Bardot, C. See Mespoulet, R., et al., jt. authors, 371.
Barger, E. H. See Graham, R., jt. author, 117.
Barkworth, H., 490.
Barling, B. See Aitken, R. S., et al., jt. authors, 322.
Barnes, M. E., 84.
Barnett, L., 284, 385.
Barondes, R. d. R., 640.
Barron, D. H. See Barcroft, J., jt. author, 446.
Barry, W. C., 41.
Bartel, H. See Lerche, M., jt. author, 439.
Bartl, P. J., 419.
Baskakoff, W. P. See Yakimoff, W. L., et al., jt. authors, 15.
Basnuevo, J., & Anido, V., 609.
Basset, J., Macheboeuf, M., & Wollman, E., 583.
Bates, R. W. See Kurzok, R., et al., jt. authors, 492.
Baudet, E. A. R. F., 299.
Bauer, 492.
Bauer, J. H., & Pickels, E. G., 449.
Baumann, R., 133.
Baylis, H. A., 183, 387.
Bayliss, M., 248.
Bayon, H. P., 333, 626.
Beach, J. R., & Schalm, O. W., 22, 262.
—. See also Lubbehusen, R. E., et al., jt. authors, 332, 532.
—. See also Schalm, O. W., jt. author, 7, 262.
Beard, J. W. See Kidd, J. G., et al., jt. author, 180, 380.
—. See also Rous, P., et al., jt. authors, 331, *bis*.
Beard, P. J., & Snow, J. E., 162.
Beath, O. A., 149.
Beaudette, F. R., & Hudson, C. B., 472.
Bechtel, H. E., Hallman, E. T., Huffman, C. F., & Duncan, C. W., 296.
—. Huffman, C. F., Duncan, C. W., & Hoppert, C. A., 253.
Beerens, J., 54.
Begg, G. W., 481.
Behrend, C., 140.
Beijers, J. H., 613.
Belikowa, O. P. See Schambouroff, D. A., 287.
Belkin, G., & Slecer, A. M., 124.
Bell, M. E., 485.
Bell, W. B. See Johnson, E. P., jt. author, 333.
Belo, M. M. A. See Sá Viana Conte, H., jt. author, 613.
Bemont, L. H. See Maw, W. A., et al., jt. authors, 123.

Bendinger, G., 131.
de Benedetti, M., 312.
Benedict, F. G., 251.
Benesch, F., & Steinmetzer, K., 37.
—, & Wurst, R., 464.
Bengtson, I. A., 27.
—. See also Pasternack, J. G., jt. author, 414.
Bennet, R. I. See Poindexter, H. A., jt. author, 163.
Bennett, S. C. J., 65, 95, 440, 500. 550.
Bennett, W. G., 372.
Bennetts, H. W., 301, 372.
Benson, K., Plum, N., & Portman, K., 630.
Bequaert, J. C. See Strong, R. P., et al., jt. authors, 231.
Ber, A., 61, 212, 370, 580.
Berens, C. See Chapman, G. H., jt. author, 566.
Berg, W. N., 409.
Berge, E., 347.
—, & Haupt, H., 518.
Berge, R. See Miessner, H., jt. author, 341.
Berger, E., 637.
—. See also Doerr, R., et al., jt. authors, 218.
Berger, H. C. L. E., 358.
van den Berghe, L., 24.
—. See also Bourguignon, G. C., et al., jt. authors, 215.
Bernard, A., 222.
Bernard, H., 58.
Berny, P., & Saint-Prix, M., 76.
Berselli, L., 302.
Berthelon. See Lesbouyries, jt. author, 321, 414.
—. See also Lesbouyries, M., jt. author, 210.
Berthelsen, H. See Hjärre, A., jt. author, 348.
Bertolini, C., 183.
Bertolini, G., 219.
Bertrand, G., & Schoenaers, F., 578.
Bertrand, I., Bablet, J., & Bloch, F., 571.
Besredka, A., 562.
Besselaar, H. J., & Quin, J. I., 86.
Bevan, L. E. W., 215, 271, 374.
Bezancon, F., & Braun, P., 362.
Bezsonova, A., Lenkaja, G., Molodova, P., & Mosolova, O., 577.
Bhatia, B. L., 170.
Biancalani, G. See Favilli, G., jt. author, 159.
Biester, H. See Schwarte, L. H., et al., jt. authors, 623.
Biester, H. E., Greenwood, D. A., & Nelson, V. E., 301.
Bijl, J. P., & van der Schaaf, A. T., 427.
Bilfinger, F. See Lépine, P., jt. author, 66.
Binder, H., 423.
Binder, L., & Fauszt, E., 580.
Bisanti, C., 78, 184.
Bisbocci, G., 116.
Biscoe, J., Pickels, E. G., & Wyckoff, R. W. G., 198.
Bishop, L. M. See Boyd, W. L., jt. author, 546.
—. See also Fitch, C. P., jt. author, 518.
Bisschop, J. H. R. See Curson, H. H., jt. author, 87.
Blacklock, J. W. S., 316.
Blakemore, F., 190.
—, & Glover, R. E., 190, 530.
—, & Stewart, J., 241.
Blaker, G. H., 534.
Blampied. T. Le Q., & Mackay, A. A., 614.
Blaschke, 325.
Bleil, E., 627.
de Blieck, L., 58.
Bloch, F. See Bablet, J., et al., jt. authors, 410.
—. See also Bertrand, I., et al., jt. authors, 571.
Boecker, E., 318.
Boell, E. J. See Huff, G. C., jt. author, 337.
Boes, 249.
Boffa. See Cerrutti, C. F., jt. author, 633.
van Bogaert, L. See Bourguignon, G. C., et al., jt. authors, 215.
de Boissezon, P., 26.
Boivin, A., & Mesrobeanu, L., 187. 288.
Bol, C. See Vertinskij, K., et al, jt. authors, 424.
Bolliger, A., 357.
Bolton, 144.
Bone, T., 307.
Bonner, A. M., 307.
Boquet, A., & Laporte, R., 260.
—, & Sandor, G., 613.
Boquet, M. See Bourgeois, P., jt. author, 234.
Borcila, J., 527.
Bordet. See Soulié, et al., jt. authors, 440.
Bordet, P., 475.
Bordiga, R. See Monti, D., jt. author, 446.
Borman, E. K. See Foote, F. M., et al., jt. authors, 313.
Bos, A. W. A., 347.
Bosman, V., 31.
Bosnic, L., 424.
Bosworth, T. J., 516, *bis*.
—, & Glover, R. E., 160.
—. See also Whitby, T. L., et al., jt. authors, 369.
Boughton, D. C., 522.
Boughton, I. B., & Hardy, W. T., 138, 356.
Bourgeois, E. See Huguenin, B., jt. author, 68.
Bourgeois, P., & Boquet, M., 234.
Bourguignon, G. C., van den Berghe, L., & von Bogaert, L., 215.
Bouvier, G., 186.
Bovet, D. See Fourneau, E., et al., jt. authors, 299.
—. See also Nitti, F., jt. author, 299.
Boyd, W. L., & Bishop, L. M., 546.
—. See also Gullickson, T. W., et al., jt. authors, 191.
—. See also Rogers, C. F., jt. author, 138.
Boynton, W. H., Herms, W. B., Howell, D. E., & Woods, G. M., 16.
—, Wood, F. W., & Wood, G. M., 636.
Braga, A., 471.
Braid, K. W., 138.
Branch, A., & Enders, J. F., 5.
Branch, E. A. G. See Derick, C. L., et al., jt. authors, 5.
van den Branden, F., 585.
Brandly, C. A., 22.
Brandt, A., 159.
Brandt, A. J., 54.
Bransburg, A. See Vertinskij, K., et al., jt. authors, 424.
Braun, P. See Bezançon, F., jt. author, 362.
Bredereck, H., 152.
Breed, F., 522, 543.
Breed, R. S., & Conn, H. J., 12.
—, Hucker, C. J., Burgwald, L. H., McCrady, McH., Myers, R. P., & Thomas, R. C., 490.
—, & St. John-Brooks, R., 64.
Breidert, 244, *bis*.
Bressou, & Florentin, 444.
Bretey, J. See Nègre, L., et al., jt. authors, 260, *bis*.
Brigando, J. See Guittonneau, G., jt. author, 490.
Brill, J., 29.
Brine, Z. M. See Gourwic, B. M., et al., jt. authors, 19.
Brion, A., 553.
Briskin, N. I. See Bachrach, M. D., jt. author, 235.
Brody, A. L., 532.
Brook, G. B., 99, 512.
Brookbank, R. E., 459.
Brooks, P. B., & Tiedeman, W. von D., 632.
Broom, J. C., Brown, H. C., & Hoare, C. A., 647.
—. See also Brown, H. C., jt. author, 647.
Brose, C. P. See Griffin, C. A., jt. author, 598.
Brown, A. W. A., 383.
Brown, H. C., & Broom, J. C., 647.
—. See also Broom, J. C., et al., jt. authors, 647.
Brown, H. W., 226.
—. See also Lamson, P. D., jt. author, 36.
—. See also Wells, W. F., jt. author, 226.
Brown, M. H., 458.
—. See also MacNabb, A. L., jt. author, 104.
Brown, M. H. V. See Henning, M. W., jt. author, 575.
Browning, C. H., & Gulbransen, R., 375.
Brownlee, A., 328, 625.
Bruder, 293.
Brueckner, A. L. See Everson, C. L., et al., jt. authors, 412.
Brug, S. L., 274.
Brumpt, E., 310.
Bruynoghe, G., 187.
Bryan, C. S., & Meyer, D. B., 136.
—, & Turney, G. J., 2.
Bryant, J. B., 434.
Buck, C. See Pilot, I., et al., jt. authors, 312.
Buck, G. See Poisson, H., jt. author, 387.
Bull, L. B., 388.
Bundesen, H. M., 489.
Bunyea, H. See Clawson, A. G., et al., jt. authors, 251.
Burgwald, L. H. See Breed, R. S., et al., jt. authors, 490.
Burnet, F. M., 22, 119, 274, 377, 378, 379, 525.
—, & Lush, D., 532.
Burrows, W., & Jordan, E. O., 209.
Busch, G., 446.
—. See also Poppe, K., jt. author, 527.
Busci, W. H. See Lubbehusen, R. E., et al., jt. authors, 332.
Butler, W. J., 511.
—, Warren, D. M., & Marsh, H., 108.
Butozan, V., 70, 198, 436.
Buxton, J. B., 410.
—, & Glover, R. E., 155.
—, —, & Griffith, A. S., 155.

Byerley, T. C., & Olsen, M. W., 189.

C

Cabassu, H. See Giraud, P., jt. author, 417.
Cabret, 415.
Cado, Y. See Lévy-Bruhl, M., jt. author, 248.
Cahen, R. See Urbain, A., et al., jt. authors, 139.
Calcinai, M., 127.
Calmette, A., 359.
Cambessédès, H. See Tanon, L., jt. author, 529.
Cameron, A. E., 280, 451.
Cameron, H. S. See Gilman, H. L., jt. author, 184.
Cameron, T. W. M., 283, 352, 609.
Caminopetros, J., 588.
Campbell, A. D., 112.
—, & Turner, A. W., 111.
Campbell, D. M., 435.
Campiglio, F., 475.
Campos, R. See Arroyo, C., jt. author, 549.
Camps, F. E., & Wood, J. L. M., 634.
Cangi, C. W., 550.
Canitano, G., 436.
Canon, P. R., & Walsh, T. E., 584.
Canu, L., 195.
Caprun, A. A., 382.
Card, L. E., 28.
Carlifanti, E., 233.
Carling, H. F. See Wilson, G. S., et al., jt. authors, 643.
Carlson, W. E. See Green, R. G., et al., jt. authors, 176.
Carlström, B., 82.
Carmichael, E. B., 36.
Carmichael, J. See Mettam, R. W. M., jt. author, 169.
Carneiro, V., 602.
Carpano, 171.
Carpano, M., 367, 420.
Carpenter, C. M. See Goldstein, J. D., jt. author, 578.
Carpentier, 46, 652.
Carpentier, G., & Pelletier, L., 537.
Carswell, R., 25.
Casida, L. E. See Chapman, A. B., jt. author, 553.
Cassamagnaghi, A., 458.
Castaneda, M. R., 478.
Catanei, A., 162, 323.
Catchpole, H. R. See Pearson, P. B., jt. author, 251, *bis*.
Caughley, F. G. See White, P., 303.
Cawston, F. G., 282.
Cazaban, F., & Isnard, J., 138.
Celarek, J., & Fejgin, B., 392.
Cernaianu, C. See Ionescu-Braila, G., jt. author, 164.
Cernjak, 575.
Cernomordik, A. B., 401.
Cerruti, C. G., 183.
Cerrutti, C. F., & Boffa, 633.
Cervinka, V., 344.
Challinor, S. W. See Topley, W. W. C., et al., jt. authors, 616.
Chandler, A. C., 386.
Chapman, A. B., & Casida, L. E., 553.
Chapman, G. H., Lieb, C. W., Berens, C., & Curcio, L., 566.
Charleux, G., 219.
Chase, W. H., & Hobday, J. H. N., 224.
Chelle, P. L. See Cuillé, J., jt. author, 16, 625.
Chevret. See Soullié, et. al., jt. authors, 440.
Cheu, S. H. See Khaw, O. K., jt. author, 298.
Chicon, F., 3.
Chitwood, B. G., & Chitwood, M. B., 660.
Chitwood, M. B. See Chitwood, B. G., jt. author, 660.
Chluscov, K. A., et al., 21.
Christenson, I., 60.
Christiansen, M., 238.
Cilli, V., 402.
Cisowski, A., 82.
Ciuca, M., Mesrobeanu, L., & Badenski, G., 9.
Clapham, P. A., 609.
Clark, R. O. J. See Topley, W. W. C., et al., jt. authors, 616.
Clawson, A. B., Couch, J. F., & Bunyea, H., 251.
Couer, A. See Mouriquand, G., et al., jt. authors, 83.
Coffey, D. J., 194.
Cohn, M. L. See Corper, H. J., et al., jt. authors, 363.
Colas-Belcour, J. See Roubaud, E., jt. author, 182, 215.
Cole, A. F., 23.
Coles, A. C., 600.
Comsia, O. See Zolog, M., jt. author, 246.
Conn, H. J. See Breed, R. S., jt. author, 12.
Constantinesco, G. K., 87.
Cordier, G., Menager, J., & Delorme, A., 167.
Corenzwit, H. M., 247.
Cornell, R. L., 650.
Coronel, A. B., 88, 418.
Corper, H. J., & Cohn, M. L., 363.
—, —, & Damerow, A. P., 363.
—, Damerow, A. P., & Cohn, M. L., 363.
Corson, J. F., 13, 215, *bis*, 271.
Cort, W. W., 231.
—, & Talbot, S. B., 231.
Cory, E. N., Harns, H. G., & Anderson, W. H., 441.
D'Costa, J., 174, *bis*.
D'Costa, R. S. J., 422.
Costigan, S. See McCulloch, E. C., jt. author, 210.
Costigan, S. M., 196.
Costil, L. See Saenz, A., jt. author, 6, 107.
Cotrufo, P., 620.
Cottier, J., 164, 453.
Couch, J. F. See Clawson, A. B., et al., jt. authors, 251.
Covell, G., McGuire, J. P., Stephens, E. D., & Lahiri, B. N., 330.
Cox, H. R., & Olitsky, P. K., 175.
—. See also Olitsky, P. K., et al., jt. authors, 377.
Craig, J. F., 208.
—, & Davies, G. O., 614.
Cram, E. B., 539.
Crane, M. P. See Derick, C. L., et al., jt. authors, 5.
Crawford, A. B., 361, 422.
Crawford, M., 204, 358.
Craydon, J. J. See Morgan, F. G., jt. author, 288.
Creech, G. T., 459.
—, & Gochenour, W. S., 239.
Cross, F. See Newsom, I. E., jt. author, 548.
Crougue, O., 514.
Crowder, J. A., Stodola, F. H., & Anderson, R. J., 56.
—. See also Anderson, R. J., et al., jt. authors, 56.
Cruz, W. O., 643.
Cubeddu, M., 153.
Cuboni, E., 198.
Cuillé, J., & Chelle, P. L., 16, 625.
—, & Darraspen, E., 540.
Cummings, G. D., 62.
Cunningham, I. J., 43, 398, *bis*.
Curcio, L. See Chapman, G. H., jt. author, 566.
Currie, J. R., 660.
Curson, H. H., & Bisschop, J. H. R., 87.
Curtis, L. R. See Stark, C. N., jt. author, 447.
Cuverkalov, D., & Kucerenko, I., 227, 276.
Czickeli, H. See Metzulescu, A., jt. author, 509.

D

Dachena, G., 379.
Dahl, G., 641.
Dale, H. H., 172.
Dalling, T., & Warrack, G. H., 190.
Damerow, A. P. See Corper, H. J., et al., jt. authors, 363.
Damon, S. R., & Hajna, A. A., 26.
Daniel, H. A., 547.
Darraspen, E. See Cullé, J., jt. author, 540.
Daubney, R., & Hudson, J. R., 21.
Davenport, C., Rabagliati, D. S., & Edwards, J. T., 544.
Davey, D. G., 284, 493, 611.
Davey, J. B., 215.
Davidson, J. S., Thompson, W. T., & Moore, J. M., 465.
Davies, G. O. See Craig, J. F., jt. author, 614.
Davies, W. M., 182.
Davis, C. L., & Shorten, H. L., 189.
Davis, C. R. See DeVolt, H. M., et al., jt. authors, 532.
Davis, D. J., 35.
—. See also Pilot, I., et al., jt. authors, 312.
Dayus, C. V., 251, 269, 370.
Dearstyne, R. S. See Greaves, R. E., et al., jt. authors, 59.
Debelic, S., 70, 386.
Dèbonera, G. See Ananiadés, B., jt. author, 521.
Dedeken, L. See De Waele, A., jt. author, 539.
Dedié, K. See Schoop, G., jt. author, 538.
Deem, A. W., 107.
van Deinse, F. See Valtis, J., jt. author, 104, 571.
Delaplane, J. P., Erwin, L. E., & Stuart, H. O., 7.
Delez, A. L., 460.
Dell, A., 139.
Delorme, A. See Cordier, G., et al., jt. authors, 167.
Delpy, L., 80, *bis*, 595.
Delves, E., 432.
Demidenko, I., Gervjatovskij, A. P., & Kapitanski, M. V., 413.
Demole, J. M. See Roch, M., et al., jt. authors, 219.
Demole, M., 219.
Dennis, E. W. See Turner, E. L., et al., jt. authors, 283.

Derflinger, E. R., 327.
Derick, C. L., Branch, E. A. G., & Crane, M. P., 5.
Derrick, J. D., 72, 175.
Deskowitz, M. See Steinbach, M. M., et al., joint authors, 364.
DeVolt, H. M., Moulthrop, I. M., & Davis, C. R., 532.
Diakov, F. A. See Hykes, O. V., jt. author, 32.
Dienes, L., 479.
Diernhofer, K., 267, *bis*, 477.
Dimock, W. W., & Edwards, P. R., 318.
—, Healy, D. J., & Hull, F. E., 295.
—. See also Hull, F. E., jt. author, 295, 621.
Dixey, R. N., 407.
Dixon, J. K. See Askew, H. O., jt. author, 84, 485, *bis*.
—. See also Kidson, E. B., et al., jt. authors, 495.
Djaenoedin, R. See Kraneveld, F. C., jt. author, 36, 583.
Djourichitch, M., 187.
—. See also Ramon, G., et al., jt. authors, 187, *bis*, 288.
—. See also Simitch, T. V., et al., jt. authors, 188, 462.
Doak, B. W., 357.
Dobberstein, 278.
Dobberstein, J., 81, 133, 342, *bis*, 359.
Doerr, R., Berger, E., Jadasson, W., & Schmidt, G. W., 218.
Doeve, W. C. A., 513.
Domanski, E., 7.
Domanski, M. A., 55.
Domansky, F., 71, 458.
Domenico, G., 436.
Dominici, D. See Alessandrini, A., jt. author, 368.
Donatien, A., & Lestoquard, F., 417, 426, 524, *ter*, 615.
—, —, & Kilcher-Maucourt, A., 376.
—. See also Lestoquard, F., et al., jt. authors, 16, 380.
—. See also Sergent, Ed., et al., jt. authors, 167, 590.
Donham, C. R., & Fitch C. P., 184, *bis*.
van Dorssen, C. A., 319.
Doubrava, O., 70.
Doudarenka, G. V. See Gourwic, B. M., et al., jt. authors, 19.
Doukaloff, I. A., 70.
Do-Van-Vien. See Granouillit, F., jt. author, 541.
Dove, W. E., 428.
Downing, W., 122, *bis*.
Drabble, J., 99.
Drieux, H. See Verge, J., et al., jt. authors, 545.
Droandi, I., 151.
Dschunkowsky, E., 596.
Dubois, A., 246, *bis*, 266.
Duckworth, C. U., 489.
Ducourtioux, M. See Bablet, J., et al., jt. authors, 410.
Dudarenka, G. V. See Gurvic, B. M., et al., jt. authors, 18.
Dufour, J. See Nattan-Larrier, L., 274.
Duke, H. L., 215, *bis*, 271.
Dumitru, I., 382.
Duncan, C. W., & Miller, E. J., 641.
—. See also Bechtel, H. E., et al., jt. authors, 253, 296.
—. See also Huffman, C. F., et al., jt. authors, 252.
Dungal, N., 521.
—, & Gislason, G., 353.
Dunkin, G. W., 208.
Dupont, O., 418.
Duran-Reynals, F., 358.
Durand, P., Giroud, P., Larrivé, E., & Mestrallet, A., 219, *ter*.
Durant, A. J., 524.
Dybing, O., 141.
Dykins, W. A., 199.
Dzunkovski, E., 416.

E

Eastman, D. A. See Pilot, I., et al., jt. authors, 312.
Eberle, J. See Anderle, R., jt. author, 239.
Edelstein, I. A. See Kachanov, G. A., jt. author, 59.
Edgar, G., 124.
Edgington, B. H., 211, 268.
Edwards, H. I. See Newton, W., jt. author, 619.
Edwards, J. T. See Davenport, C., et al., jt. authors, 544.
Edwards, P. R., 2, 159, 209, *bis*, 576.
—. See also Dimock, W. W., jt. author, 318.
Edwards, S. J., 3, 238.
—. See also Nichols, A. A., jt. author, 362, 488.
Egan, T. J., 558.
Egehoj, J., 196.
—, & Plum, N., 103.
Egli, J. F., 348.
Egoroff, S. W. See Poltyreff, S. S., et al., jt. authors, 644.
Ehringer, G. See Hauduroy, P., et al., jt. authors, 561.
Ehrlich, C., 4.
Eickel, F., 40.
Eickmann, H., 464.
—, & Eschbaum, T., 477.
Eide, C. J., 65.
Ejsmont, L., 285.
Elford, W. J., 381.
—, & Andrews, C. H., 381.
—, & Galloway, I. A., 380.
—. See also Galloway, I. A., jt. author, 377, 470.
Ellenbogen, V. See Adler, S., jt. author, 167.
Elzén, S., 26, 82.
Emmel, M. W., 294, 577, 642.
—, & Knapp, B., Jr., 30.
—. See also Sanders, D. A., et al., jt. authors, 138.
Enders, J. F. See Branch, A., jt. author, 5.
Englebreth-Holm, J. See Uhl, E., et al., jt. authors, 333.
Enigk, K., 440.
Epstein, G. W., Ravich-Birger, E. D., & Svinkina, A. A., 157.
Ercegovac, D., 198, 252.
Erhardt, 264.
Eriksson, K., 298.
Ernesti, S., & Zerbel, E., 267.
Errington, B. J., 447.
Erwin, L. E. See Delaplane, J. P., et al., jt. authors, 7.
van Es, L., 509.
—, & McGrath, C. B., 573.
Escande, O., 506.
Eschbaum, T. See Eickmann, H., jt. author, 477.
Esin, I. See Kólayli, C., et al., jt. authors, 49.
Euler, 481.
Evans, A. C., 49, 121, 507, 580.
Evans, W. M., 357.
Evans, S. A., 579.
—. See also Wilson, D. E., jt. author, 460.
Everson, C. L., Poelma, L. J., & Brueckner, A. L., 412.
Eyraud, E., Velu, H., & Zottner, G., 163.
Eyre, J., 63.

F

Fabre, G., 212.
Fagioli, O., 436.
Falk, C. R., & Aplington, S. P., 354.
Fallis, A. M. See LaRue, G. R., jt. author, 385.
Faulenborg, G., & Plum, N., 154.
Faure, L., 72.
Faure-Brac, G., 352.
Faustmann, 52.
Fauszt, E. See Binder, L., jt. author, 580.
Favilli, G., & Biancalani, G., 159.
Fejgin, B. See Celarek, J., jt. author, 392.
Feldman, W. H., 5, 156.
—, & Fitch, C. P., 389.
—, Hester, H. R., & Wherry, F. P., 340.
—. See also Olsen, C., Jr., jt. author, 156.
Fenstermacher, R., 482.
Ferauge, & Meirheaghe, 126.
Ferguson, J. H., 251.
Ferreira, J., 458.
Fertig, H., 18.
—. See also Kobe, K., jt. author, 528.
Ferwerda, S. See Tenhaef, C., jt. author, 385.
Finch, R., 145.
Fincher, M. G., 241.
—. See also Gibbons, W. J., jt. author, 515.
Findlay, G. M., 275.
—, & McKenzie, R. D., 605.
—. See also Mackenzie, R. D., et al., jt. authors, 426, 605.
Finlayson, M. H. See Schütze, H., et al., jt. authors, 237.
Finzi, G., 406.
Fischer, 442.
Fischer, C., 293.
Fischer, G., 494.
Fischl, V., 636.
Fisk, R. T. See Hoyt, A., et al., jt. authors, 471.
Fitch, C. P., Bishop, L. M., & Kelly, M. D., 518.
—, & Thompson, C. M., 211.
—. See also Donham, C. R., jt. author, 184, *bis*.
—. See also Feldman, W. H., jt. author, 389.
Fitch, L. W. N., 592, 639.
Fletcher, J. M., & Galloway, I. A., 470.
Florentin. See Bressou, jt. author, 444.
Flückiger, G., 245, 291.
Folger, A. F., 631.
Foote, F. M., Welch, H., West, D. E., & Borman, E. K., 313.
Fooy, J. P., 398.
Foresti, C. See Lanfranchi, A., jt. author, 390.
Forgeot, E., 219.
Forgeot, P. See Weinberg, M., et al., jt. authors, 581.
Foster, A. O., 336, 611.
Fotheringham, W., 330.
Fourneau, E., Tréfouël, J., Nitti, F., & Bovet, D., 299.

Fox, J. P., 236.
Fox, W. W. See Goldstein, J. D., et al., jt authors, 578.
Francis, T., Jr. See Shope, R. E., jt. author, 226.
Franco, E., 479, *ter*.
Frank, E. R., & Scott, J. P., 321.
Frank, L. C., 194.
Franke, K. W., & Moxon, A. L., 443.
—, Moxon, A. L., Poley, W. E., & Tully, W. C., 137.
—, & Painter, E. P., 136, 137.
—, & Potter, van R., 356.
—, & Tully, W. C., 250.
—. See also Painter, E. P., jt. author, 137, *bis*.
—. See also Smith, M. I., et al., jt. authors, 640.
Franklin, M. C., 83.
Fraps, G. S. See Sherwood, R. M., jt. author, 442, *bis*.
Fraser, A. H. H., & Robertson, D., 608.
—, —, & Ritchie, J. E., 284, *bis*.
Fraser, W. A. C., 36.
Frauchiger, E., 624.
Freeman, A. E., Jr., & Ackert, J. E., 610.
Frei, W., 320, 520.
—, & Froebel, O., 64.
French, M. H., 114, 275, *bis*, 585, 586, 640, 646, *bis*.
—, & Hornby, H. E., 586.
Freund, E., 61.
Freund, J., Laidlaw, E. H., & Mansfield, J. S., 390.
Fricker, O., 101.
Frickers, J., 308.
Friedman, A. P., Sochor, N. I., Glinka-Cernoruckaja, E. L., Pebrova, V. V., Arkina, R., Aleksandrov, B. A., Zarjadova, E. A., & Pogonajlo, G. F., 115.
Friedmann, F. F., S.
Frierling, H., 381.
Fritzsche, K., 133.
Froebel, O., 394.
—. See also Frei, W., jt. author, 64.
Frykholm, N., 655.
Fujimura, S., & Hoshi, T., 318.
Fuller, M. E. See Mackerras, I. M., et al., jt. authors, 382.
Fulton, MacD. See Stuart, C. A., et al., jt. authors, 236.
Furth, J., 294.

G

Galanowa, N. W., 77, 78.
—. See also Kritschewski, I. L., jt. author, 77, *bis*, 390.
Gallavan, M. See Reichle, H. S., jt. author, 514.
Galli, M., 128, 129.
Gallina, L., 349.
Galloway, I. A., & Elford, W. J., 377, 470.
—. See also Elford, W. J., jt. author, 380.
—. See also Fletcher, J. M., jt. author, 470.
Gann, S., 307.
Garaguli, A. See Balteanu, I., et al., jt. authors, 155.
Garcia, E. Y. See Africa, C. M., et al., jt. authors, 387.
Le Gard, H. M. See Gwatkin, R., et al., jt. authors, 455.
Garewal, J. S., 556.
Garofolo, T., 268.
Garrigues, 612.
Garrison, E. R., & Turner, C. W., 85.
von Gartzen, M. See Seelemann, M., et al., jt. authors, 549.
Gauchot, G., 376.
Gaud, M., 66.
Gauger, H. C., 268.
—. See also Greaves, R. E., et al., jt. authors, 59.
Gehring, K., 628.
Generoso, J. D., 35.
Gentile, G., 283.
Gerlach, F., 379, 542.
—, & Schweinburg, F., 599.
Gervjatovskij, A. P. See Demidenko, I., et al., jt. authors, 413.
Geurden, L., 475.
Ghinelli, I., 373.
Ghose, S. C., 554.
Gibbons, W. J., & Fincher, M. G., 515.
Gibbs, C. S., 22, 380.
de Gier, C. J., 356.
Gilbert, S. J., 453.
—, & Simmins, G. B., 117.
Gildemeister, E., 493.
Gilkes, H., 215.
Gill, D. A., 214, 321.
—. See also Stephens, E. H., jt. author, 316.
Gillain, J., 69, 116.
Gilman, H. L., & Cameron, H. S., 184.
Giltner, W., 560.
Gins, H. A., 534.
Giordano, O., 302.
Girard, G., 208.
—, & Robic, J., 392.
Girardot, M., 465.
Giraud, P., & Cabassu, H., 417.
Giroud, P. See Durand, P., et al., jt. authors, 219, *ter*.
Gisatullin, H. G., 131.
Gislason, G. See Dungal, N., jt. author, 353.
Glättli, H., 63.
Glaser, R., 397.
Glembockij, J. L., & Moiseev, S. B., 630.
Gliesch, R., 577.
Glinka-Cernoruckaja. See Friedman, A. P., et al., jt. authors, 115.
Glover, R. E., 116.
—, & Griffith, A. S., 156.
—. See also Blakemore, F., jt. author, 190, 530.
—. See also Bosworth, T. J., jt. author, 160.
—. See also Buxton, J. B., et al., jt. authors, 155.
Glud, P. See Pedersen-Bjergaard, K., jt. author, 140.
Gochenour, W. S., Schoening, H. W., Stein, C. D., & Mohler, W. M., 259.
—. See also Creech, G. T., jt. author, 239.
Goebel, W. F., 188.
Goerttler, 352.
Goerttler, V., 480.
Görtzen, J., 582.
Goettsch, M., Pappenheimer, A. M., & Hart, A., 399, 548.
Götze, R., 345.
—, & Müller, J., 25, 264.
Gojkovic, D. See Hupbauer, A., jt. author, 50.
Golaszewski, H., 54.
Golding, J. See Mattick, E. C. V., jt. author, 252.
Goldstein, J. D., Fox, W. W., & Carpenter, C. M., 578.
Gonzalez, B. M. See Manresa, M., jt. author, 375.
González Alvarez, R., 97.
Goosmann, C., 39.
Gordon, H. McL., & Ross, I. C., 441.
—. See also Ross, I. C., jt. author, 205.
Gordon, R. E., & Hagan, W. A., 270.
Gordon, S. See López, C., et al., jt. authors, 277.
Gorer, P. A. See Schütze, H., et al., jt. authors, 237.
Goret, P., 188.
—, Bardach, N., & Lelandais, E., 392.
—, Vuillaume, P., & Lelandais, E., 391.
Gould, G. N. See Stableforth, A. W., et al., jt. authors, 463.
Gourwic, B. M., Brine, Z. M., Doudarenka, G. V., & Lasina, D. M., 19.
Gousseff, W. F., Rastegajeff, E. P., & Soussko, S. F., 591.
—. See also Yakimoff, W. L., et al., jt. authors, 15, 247, 417.
Goussew, A. A. See Tscherniak, W. Z., et al., jt. authors, 323.
Gow, A., Jr., & Hamilton, A. B., 412.
Goyal, R. K., 157, 569.
Goyanes, J., 467.
De Graaf, C., 539.
Graham, R., 262, 318.
—, & Barger, E. H., 117.
—, & Harris, B., 317.
—, & Michael, V. M., 451.
—. See also Thorp, F., Jr., jt. author, 118.
Graham, W. R., Jr., Kay, H. D., & McIntosh, R. A., 494.
Granon-Fabre, P. See Pérès, G., jt. author, 413.
Granouillit, F., & Do-Van-Vien, 541.
Gratzl, E., 293.
Gray, D. F., 357.
Greaves, R. E., Dearstyne, R. S., & Gauger, H. C., 59.
Green, B. B. See Green, R. G., et al., jt. authors, 176.
Green, H. H., 437.
Green, R. G., 483.
—, Green, B. B., Carlson, W. E., & Shillinger, J. E., 176.
—, & Shillinger, J. E., 472.
Greenwood, D. A. See Biester, H. E., et al., jt. authors, 301.
Gregory, K. K. See Stuart, C. A., et al., jt. authors, 236.
Greig, J. R., 516, 521.
Greves, R. I. N., & Adair, M. E., 448.
Grieder, H., 608.
Griffin, C. A., & Brose, C. P., 598.
Griffith, A. S., 52.
—. See also Buxton, J. B., et al., jt. authors, 155.
—. See also Glover, R. E., jt. author, 156.
Griffiths, H. J., 541.
Grignani, A., 394.
Grillo, H., & Schmitz, J., 636.
Grim, J., 130.
Grimpret, G. See Velu, H., et al., jt. authors, 636.
Grimpret, J., 522.
Grini, O., 82.
Groome, J. R. See Zuckerman, S., jt. author, 546.
Groth, A. H. See Newsom, I. E., et al., jt. authors, 641.

Groulade, P., 312.
Grüneberg, H., 408.
Grysez, V., 470.
Grzimek, 496.
Guelin, A. See Weinberg, M., jt. author, 287.
Guenther, D. F., 543.
Guenther, F., 538.
Guilherme Lacorte, J., 430.
Guillaumie, M. See Weinberg, M., jt. author, 27, *bis*, 160, 581.
Guillot, G. See Hauduroy, P., et al., jt. authors, 561.
Guittonneau, G., & Brigando, J., 490.
Gulbransen, R. See Browning, C. H., jt. author, 375.
Gullickson, T. W., Palmer, L. S., & Boyd, W. L., 191.
das Gupta, B. M., 325.
Gurewitsch, D. I. See Poltyreff, S. S., et al., jt. authors, 644, *bis*.
Gurvic, B. M., Dudarenka, G. V., Lasina, O. M., & Majboreda, A. A., 18.
Gustus, E. L., Meyer, R. K., & Woods, O. R., 88.
Gutha Thakurta, S. R. See Ukil, A. C., jt. author, 261.
Guthe, T., 261.
Guyer, M. F., 408.
Gwatkin, R., Hadwen, S., & Le Gard, H. M., 455.
Gye, W. E., 658.

H

Haagen, E., 594.
Haber, P., 178.
—. See also Levaditi, C., et al., jt. authors, 178.
Haddad, M. See Heller, V. G., jt. author, 296.
Haddow, A. J., & Thomson, R. C. M., 537.
Hadwen, S. See Gwatkin, R., et al., jt. authors, 455.
Hagan, W. A., 461.
—. See also Gordon, R. E., 270.
Hajna, A. A. See Damon, S. R., jt. author, 26.
Hale, M. W. See Rees, C. W., jt. author, 327.
Hallenborg, T., 629.
Hallman, E. T. See Bechtel, H. E., et al., jt. authors, 296.
Haman, R. W., & Steenbock, H., 85.
Hamerski, E., 73, 345.
Hamilton, A. B. See Gow, A., Jr., jt. author, 412.
Hamilton, H. P., 626.
Hammann, H., 574.
Hammar, J. A., 444.
Hanne, R., 442.
Hansen, A., & Schmidt, S., 17.
—, —, & Oerskov, J., 329.
—. See also Oerskov, J., et al., jt. authors, 421.
—. See also Schmidt, S., et al., jt. authors, 16, 17, 329, 420, 469.
—. See also Schmit-Jensen, H. O., et al., jt. authors, 329, 420.
Hansen, K., & Köster, H., 321.
—. See also Miessner, J., jt. author, 14.
Hansman, F. S., 142.
Hardenbergh, J. G., 89.
Hardy, W. T. See Boughton, I. B., jt. author, 138, 356.
Hare, T., 621.
Harland, H., 157.
Harms, F. See Miessner, H., jt. author, 289.
Harnach, R., 317.
Harns, H. G. See Cory, E. N., et al., jt. authors, 441.
Harris, B. See Graham, R., jt. author, 317.
Harris, L. J., 564.
Harshfield, G. S. See Roderick, L., et al., jt. authors, 485.
Harskey, K. R., 183.
Hart, A. See Goettsch, M., et al., jt. authors, 399.
Hart, A. See also Pappenheimer, A., et al., jt. authors, 548.
Hartman, G., 311.
Hartmann, A. F. See Julianelle, L. A., jt. author, 314.
Hartwigk, H., 341, 484.
Harvey, W. C., & Hill, H., 407.
Hasskó, A. See Scheff, G., jt. author, 246.
Hastings, C. C., 544.
Hauduroy, P., Ehringer, G., Urbain, A., Guillot, G., & Magrou, J., 561.
Hauge, K., 226.
Haupt, H., 578.
—, & Stockmann, H., 578.
—. See also Berge, E., jt. author, 518.
Haurowitz, F., 617.
Hawn, M. C. See Roderick, L., et al., jt. authors, 485.
Hayden, C. E. See Sampson, J., jt. author, 241.
Hayes, F. M., 579.
Healy, D. J. See Dimock, W. W., et al., jt. authors, 295.
Heathman, L. S., 125.
—. See also Higginbotham, M., jt. author, 10.
Heck, J. H., 57, *bis*.
Hecke, F., 528.
Hegner, R., 328, 415.
Hegner, R. W., 360.
Hegyeli, Z., 423, *bis*.
Heicken, K., 196, *bis*.
Heidegger, E., 281.
Heidelberger, M., & Kendall, F. E., 236.
Heidrich, 30.
Heijl, C., 349.
Heiss, K., 191, 244.
Heller, V. G., & Haddad, M., 296.
—, & Penquite, R., 192.
Hellesnes, A. P., 589.
Hellesnes, P., 7.
—, & Holmboe, F. V., 622.
Hemmert-Halswick, G., 316.
Henderson, W. W., 147.
Hendrickx, H., 641.
Hendry, E. B. See Stamp, T. C., jt. author, 616.
te Hennepe, B. J. C., 341.
Henning, M. W., 318.
—, & Brown, M. H. V., 575.
Henrard, C. See van Hoof, L., et al., jt. authors, 585.
Henricsson, E., 462.
—, & Lindström, B., 110.
Henry, A., 13.
Henry, E. See Rodhain, J., jt. author, 273.
Henry, M., 146, 388.
Hepding, L., 132.
Herman, C. M., 524.
Hermansson, K. A., 430.
Herms, W. B., & Howell, D. E., 170.
—. See also Boynton, W. H., et al., jt. authors, 16.
Herrick, C. A., & Holmes, C. E., 270.
—, Ott, G. L., & Holmes, C. E., 270, *bis*.
Herrmann, O., Korjukin, E., & Spiridonow, N., 62.
Hertha, K., 127, 491, *quat*.
Hertz, J., 31, 192.
Hester, H. R. See Feldman, W. H., et al., jt. authors, 340.
Hetzel, H., 345.
Heyck, 438.
Hieronymi, E., 266.
Higginbotham, M., & Heathman, L. S., 10.
Hinman, E. H., & Baker, D. D., 230.
Hinman, R. See Hughes, E. H., jt. author, 546.
Hinshaw, W. R., & Hoffman, H. A., 577.
Hirano, N., & Sayama, K., 533.
Hirt, G., 424.
Hjärre, A., & Berthelsen, H., 348.
Hoare, C. A., 273.
—. See also Broom, J. C., et al., jt. authors, 647.
Hobday, J. H. N. See Chase, W. H., jt. author, 224.
Hobson, R. P., 280.
Hockley, J. See McCulloch, R. N., et al., jt. authors, 383.
Hodge, H. H., & Sherman, J. M., 507.
Höffiger, H., 630.
Hofferber. See Müssemier, jt. author, 653.
Hofferber, O., 72, 597.
Hoffman, F., 227, 277.
Hoffman, H. A. See Hinshaw, W. R., jt. author, 577.
Hollborn, K., 253.
Holm, A., Anderson, J. F., & Leonard, G. F., 287.
Holm, G. See Lee, C. D., et al., jt. authors, 210.
Holmboe, F. V. See Hellesnes, P., jt. author, 622.
Holmes, C. E. See Herrick, C. A., et al., jt. authors, 270, *bis*.
Holmes, R. P., 144.
Holt, L. B., 287.
Holth, H., & Amundsen, H., 54.
Holz, K., 624, *bis*.
Homutov, P., 51.
Honess, R. F., 15.
van Hoof, L., Henrard, C., & Peel, E., 585.
Hopkirk, C. S. M., 42, 83, 86, 551.
Hoppert, C. A. See Bechtel, H. E., et al., jt. authors, 253.
Horgan, E. S., 288.
—, & McKinnon, R. M., 600.
Hornby, H. E., 588, 649.
—. See also French, M. H., jt. author, 586.
Horne Jensen, B., 589.
Horsfall, M. W. See Jones, M. F., jt. author, 231, *bis*.
Horvath, E., 552, 639.
Hoshi, T. See Fujimura, S., jt. author, 318.
Hosny Mahmoud, A. See Morcos, Z., jt. author, 58.
Host, P., & Sveinson, S., 189.
Hotopp, M., & Kahn, M. C., 157.
Hottle, G. A. See Rawlings, W. B., jt. author, 371.
Houthuis, M. J. J., 55.
Howarth, J. A., 36.
Howe, K. R. See McCulloch, R. N., et al., jt. authors, 383.

Howell, D. E. See Boynton, W. H., et al., jt. authors, 16.
—. See also Herms, W. B., jt. author, 170.
Hoyt, A., Fisk, R. T., Moore, F. L., & Tracy, R. L., 471.
Hruska, C., 159.
Hsü, H. F., 281.
Hu, C. K., Rosahn, P. D., & Pearce, L., 278.
—. See also Pearce, jt. author, 278, *bis*, 279.
—. See also Rosahn, P. D., et al., jt. authors, 278, *ter*.
Huber, F. L., & Kraneveld, F. C., 63.
Hucker, C. J. See Breed, R. S., et al., jt. authors, 490.
Huddleson, I. F., 136.
Hudec, I., 248.
Hudson, C. B. See Beaudette, F. R., jt. author, 472.
Hudson, J. R., 605.
—. See also Daubney, R., jt. author, 21.
Hudson, N. P. See Markham, F. S., jt. author, 534.
Huff, G. C., 337.
—, & Boell, E. J., 337.
Huffman, C. F., & Duncan, C. W., 252.
—, —, & Lightfoot, C. C., 252.
—. See also Bechtel, H. E., et al., jt. authors, 253, 296.
—. See also Duncan, C. W., jt. author, 252.
Huggins, C., 44.
Hughes, E. H., & Hinman, R., 546.
Hughes, W. H., 619.
Huguenin, B., & Bourgeois, E., 68.
Hull, F. E., & Dimock, W. W., 621.
—. See also Dimock, W. W., et al., jt. authors, 295, *bis*.
Hundhammer. See Schmidt-Hoensdorf, et al., jt. authors, 244.
Hungerford, T. G., 419.
Hunt, G. A., 638.
Hupbauer, A., 57.
—, & Bakotic, L., 634.
—, & Gojkovic, D., 50.
—, & Malensek, S., 175.
—, & Tomasec, I., 71.
Hurd-Karrer, A. M., & Kennedy, M. H., 250.
Hurst, E. W., 605.
Husband, A. D., 45.
Hutschenreiter, C., 37.
Hyde, R. R., 179, *bis*.
Hykes, O. V., & Diakov, F. A., 32.

I

Imura, K., 104.
Inántsy, E., 423.
Innes, J. R. M., 131, 132, 134, 571, 631.
—. See also Whitby, T. L., et al., jt. authors, 369.
Ionescu-Braila, G., & Cernaianu, C., 164.
Iriminoiu, I., 395.
Isaacs, R., 553.
Isabolinski, M., Lewzow, I., & Tschernjak, I., 117.
Ishibashi, T., 261.
Isnard, J. See Cazaban, F., jt. author, 138.
Ivanov, N. F. See Smanenkov, N. A., jt. author, 391.
Iványovics, G., 568, *bis*.
Iwanoff, K., 101, *bis*.
Iyer, P. R. K., 373.
Iyer, S. G. See Kaura, R. L., jt. author, 532.

J

Jaarsma, R., 198.
Jabotinsky, J. M., 132.
Jack, R. W., 44, 536.
Jackson, C., 631.
Jacob, E., 51.
Jacobs, J. See Landsteiner, K., jt. author, 431.
Jacotot, H., 173, 174, 272, 277, 422.
Jadasson, W. See Doerr, R., et al., jt. authors, 218.
Jakobkiewicz, J., 478, *bis*.
Jalabert, E. See Panisset, L., jt. author, 2.
von Jancsó, H. See von Jancsó, N., jt. author, 635, 637.
von Jancsó, N., & von Jancsó, H., 635, 637.
Jansen, J., 8, *bis*.
Januschke, E., 49, 568.
Jason, M., 241.
Jeffs, H. B., 194.
Jensen, B. H., Plum, N., & Werdelin, C., 431.
Jensen, E. A., 121.
Jepsen, A. See Bang, O., jt. author, 104.
Jeramec, C., 161.
Jerstad, A. C., 430.
de Jesus, Z., 338.
Jezic, J., 450.
—, & Kodrnja, E., 102, *bis*, 567.
Jirka, F. J., 9.
Johansson, S., 76.
Johnen, F. L., 239.
Johnson, C. M., 65, *bis*.
Johnson, E. P., & Anderson, G. W., 210.
—, & Bell, W. B., 333.
Johnson, R. E. See Plastridge, W. N., et al., jt. authors, 311.
Johnston, J. W., & Wilson, J. E., 626.
Johnstone, H. G., 298.
Johnstone, W. K., 144.
Joltran, E., 90.
Jones, M. F., & Horsfall, M. W., 231, *bis*.
Jonker, B., 547.
Jonnesco, D., 74.
Jordan, E. O. See Burrows, W., jt. author, 209.
Jorge, R., 66.
Jorgensen, J. J. See Taylor, R. M., jt. author, 265.
Jorgensen, M., 285.
Josland, S. W., 249, 303.
Jourdonais, L. F. See Nungester, W. J., et al., jt. authors, 64.
Jude, A. See Sacquepée, E., et al., jt. authors, 188.
Julianelle, L. A., 566.
—, & Hartmann, A. F., 314.
Julien, J., & Laurent, P., 186.
Junack, M., 438.
Jusatz, H. J., 620.

K

van der Kaay, J. C., 443.
Kabler, P., & MacLanahan, M., 110.
Kachanov, G. A., & Edelstein, I. A., 59.
Kaempffer, A. See Schermer, S., jt. author, 480.
Kahn, M. C. See Hotopp, M., jt. author, 157.
Kairies, A., & Schwartzer, K., K., 317.
Kalikin, B., 175, 367.
Kalmikov, E. S., 15.
Kalwaryjske, B. E., 232.
Kalweit, K., 2.
Kambayashi, T., & Otake, S., 65.
Kampik, K., 455.
Kanazawa, K., 331.
Kankaanpää, V., 560.
Kapitanaki, M., Kapustin, M., & Pisarev, E., 115.
Kapitanski, M. V. See Demidenko, I., et al., jt. authors, 413.
Kapustin, M. See Kapitanaki, M., et al., jt. authors, 115.
Karasawa, S. See Nohmi, S., et al., jt. authors, 579.
Karatchentzeff. See Milian, jt. author, 162.
Karkadinovsky, J. A., 61.
Karneev, N. E., 639.
Karsten, 264, 513.
Kasansky, I. I., 375.
Kassis, I. See Turner, E. L., et al., jt. authors, 283.
Katchanov, G. A., 81.
Kathe, & Lerche, 492.
Katow, M. See Nohmi, S., et al., jt. authors, 579.
Kau, L. S., & Wu, K., 281.
Kauffmann, F. See Orskov, J., jt. author, 288.
Kaura, R. L., & Iyer, S. G., 532.
Kauzal, G., 387.
Kawana, H. See Komiya, Y., jt. author, 281.
Kay, H. D., 490, 503, *bis*.
—. See also Graham, W. R., Jr., et al., jt. authors, 494.
Kelland, P. J. L., 91.
Keller, A. E., & Leathers, W. S., 230.
Keller, F., 72.
Keller, K., & Niedoba, T., 629.
Kelly, M. D. See Fitch, C. P., jt. author, 518.
Kelser, R. A., 324, 423.
Kendall, F. E. See Heidelberger, M., jt. author, 236.
Kennan, H. C., 441.
Kennedy, G. J., 119.
Kennedy, M. H. See Hurd-Karrer, A. M., et al., jt. authors, 250.
Kenedy, W. P., & Mackay, I., 139.
Kerbler, N., 601.
—. See also Köves, J., jt. author, 601.
Kerr, K. B., 611.
Kerr, P. J., 555.
Keschner. See Yakimoff, W. L., et al., jt. authors, 15.
Keylock, H. E., 460.
Khaw, O. K., & Cheu, S. H., 298.
Kidd, J. G., Beard, J. W., & Rous, P., 180, 380.
—. See also Rous, P., et al., jt. authors, 331, *bis*.
Kidson, E. B., 485.
—, Askew, H. O., & Dixon, J. K., 495.
Kielanowski, T. See Loukidis, E., jt. author, 156.
Kien-Hun, B., & Wang Kan, 11.
Kilcher-Marcourt, A. See Donatien, A., et al., jt. authors, 376.
Killham, B. J., 517.
King, C. G., 39.
Kinsley, A. T., 530.

van Kirk, H. C. See Rochwell, G. E., jt. author, 288.
Kirsch, W., 437.
Kiseleff, E. V., 70, *bis*.
Kissell, P. See de Lavergne, U., jt. author, 25.
Kitselman, C. H., 412.
Kjeldbjerg, J., 103.
Kjos-Hansen, J., 226.
Klein, S. J. See Steinbach, M. M., et al., jt. authors, 364.
Klek, L. See Pyl, G., jt. author, 420.
Klieneberger, E., & Steabben, D. B., 583.
Kligler, I. J., & Olitzki, L., 271.
—. See also Komarov, A., jt. author, 332.
Klimmeck, 412.
Klimmer, M., 457.
Klobouk, A., 130, 475.
Knapp, B., Jr. See Emmel, M. W., jt. author, 30.
Knaysi, G., 253.
Knight, B. C. J. G., 214, 567.
Knilans, A. J., 546.
Knipling, E. F., & Wells, R. W., 536.
Knoll, H., 401.
Knoth, M., 411.
Knowlton, G. F., 23.
—. See also Madsen, D. E., et al., jt. authors, 175.
Kobusiewicz, T. M., 214, 237.
Koch, W., 51, 141, 189, 355, *bis*.
de Kock, G., & Robinson, E. M., 227, 603.
Kodama, T., 313.
Kodrnja, E. See Jezic, J., jt. author, 102, *bis*, 567.
Köbe, K., 18, 222, 411, 526.
—, & Fertig, H., 528.
—. See also also Waldmann, O., et al., jt. authors, 596.
König, F. See Wollenweber, N., et al., jt. authors, 628.
Koepplin, F., 344.
Köster, H. See Hansen, K., jt. author, 321.
Köves, J., & Kerbler, N., 601.
Koffman, M., 592.
Kofoid, C. A., McNeil, E., & Wood, F. D., 635.
Kólayli, C., Koyguoglu, R., & Esin, I., 49.
—, Mavridis, N., & Arayci, E., 392.
Kolbe, F., 438.
Kolesnikova, Z. I. See Tumanskij, V. M., jt. author, 577.
Kolmer, J. A. See Rose, S. B., et al., jt. authors, 160.
Kolomietz, G. S., 324.
Kolomietz, J. S., 181.
—, & Pilipenko, M. K., 466.
Komarov, A., & Kligler, I. J., 332.
Komiya, Y., & Kawana, H., 281.
Koneva, Z. P., 15.
Konstantinov, A. G., 68.
Kopciowska, L., 177, *bis*.
—. See also Nicolau, S., jt. author, 74, 177, *bis*, 178.
Kopek, I., 381.
Korjukin, E. See Herrmann, O., et al., jt. authors, 62.
Korkhaus, 496.
Kouchakoff, P., 462.
Koudrjasov, M. See Kudjavcev, A., et al., jt. authors, 240.
Kouwenaar, W., & Wolff, J. W., 467.
Koyguoglu, R. See Kólayli, C., et al., jt. authors, 49.
Kranenburg, J., 37.
Kraneveld, F. C., 11, 76, 300.
—, & Djaenoedin, R., 36, 583.
—. See also Huber, F. L., jt. author, 63.
Krassnoff, D. See Levaditi, C., et al., jt. authors, 178, 380, 470.
Krembs, J., & Seifried, O., 345.
Krishniengar, K., 559.
Kritschewski, I. L., & Gallanowa, M. W., 77, *bis*, 390.
Krueger, A. P., & Nichols, V. C., 79.
Krupski, A., & Almasy, F., 631.
—, & Osterwalder, H., 76.
Kubo, M., 324.
Kucel, J., 627.
Kucerenko, I. See Cuverkalov, D., jt. author, 227, 276.
Kudriavtsev, A. A., 21.
Kudrjavcev, A., Koudrjasov, M., & Trojanovskij, D., 240.
Kuhlmann, H., 4, 126.
Kuhn, E., 244.
Kujumgieff, I., 478.
Kunert, H., 635.
—. See also Schilling G., et al., jt. authors, 586.
Kuppusamy, A. R., 171, 426.
Kurzok, R., Bates, R. W., Riddle, O., & Miller, E. G., Jr., 492.
Kutscherenko, J. J., 277.

L

Labatut, A. See Lasserre, R., jt. author, 518.
Lacorte, G. J., 614.
Lägel, 496.
Lagerlöf, N., 645.
Lagodsky, H. See Launoy, L., jt. author, 218, *bis*, 273.
Lagrange, E., & Lagrange, M. T., 234.
Lagrange, M. T. See Lagrange, E., jt. author, 234.
Laidlaw, E. H. See Freund, J., et al., jt. authors, 390.
Lajo, T. V. See López, C., et al., jt. authors, 172.
Laktionov, A. M., & Posrednik, F. J., 2.
Lamont, H. G., 208.
Lamson, P. D., & Brown, H. W., 36.
Landau, A. See Steenken, W., Jr., jt. author, 107.
Landsteiner, K., & Jacobs, J., 431.
Lane, C., 283.
Lanfranchi, A., & Foresti, C., 390.
—, & Pacchioni, G., 368.
Lang, 572.
Langdon-Brown, W., 645.
Lange, F., 213.
Lapage, G., 336.
Laporte, R., 261.
—. See also Boquet, A., jt. author, 260.
Larisch, W., 267.
Larrivé, E. See Durand, P., et al., jt. authors, 219, *ter*.
Larsson, G., 476.
LaRue, G. R., & Fallis, A. M., 385.
Lasina, D. M. See Gourwic, B. M., et al., jt. authors, 19.
Lasina, O. M. See Gurvic, B. M., et al., jt. authors, 18.
Lasserre, R., & Labatut, R., 518.
László, F., 51, 367, 396.
Launoy, L., 217.
—, & Lagodsky, H., 218, *bis*, 273.
—, Prieur, M., & Ancelot, A., 218.
Laurent, P. See Julien, J., jt. author, 186.
de Lavergne, U., & Kissel, P., 25.
Laverick, J., 23.
Lawrynowicz, A., 351.
Leathers, W. S. See Keller, A. E., jt. author, 230.
LeBlanc, T. J., & Welborn, M. B., 354.
Leclainche, E., 255, *bis*, 304.
Leclainche, X., & Verge, J., 528.
Lee, A. M., 149.
Lee, C. D., Holm, G., & Murray, C., 210.
Leger, M. See Mesnil, F., et al., jt. authors, 215.
Legg, J., 67.
Legroux, R., 574.
Lehnert, E., 305.
Leifson, E., 448.
Leiper, R. T., 537.
Lelandais, E. See Goret, P., et al., jt. authors, 391, 392.
Lemétayer, E. See Mespoulet, R., et al., jt. authors, 371.
Lenkaja, G. See Bezsonova, A., et al., jt. authors, 577.
Lentz, R. W., 81.
Leonard, G. F. See Holm, A., et al., jt. authors, 287.
Leonard, M. A., 300.
Leonhardt, L., 245.
Lépine, P., 427.
—, & Bilfinger, F, 66.
Lerche, 351.
—. See also Kathe, jt. author, 492.
Lerche, M., 411, *bis*.
—, & Bartel, H., 439.
—, Nieder, H. J., & Zinn, E., 549.
Lesbouyries, & Berthelon, 321, 414.
Lesbouyries, M., 604.
—, & Berthelon, 210.
Leskien, I., 4.
Leslie, A., 12, 32.
Lestoquard, F., & Donatien, A., 380.
—, —, & Salord, C., 16.
—. See also Donatien, A., et al., jt. authors, 376, 417, 426, 524, *ter*, 615.
—. See also Sergent, Ed., et al., jt. authors, 167, 590.
Letard, E., 87.
Leulier, A. See Mouriquand, C., et al., jt. authors, 83.
Levaditi, C., & Haber, P., 178.
—, Païc, M., Haber, P., & Krassnoff, D., 178.
—, —, Krassnoff, D., & Voot, J., 470.
—, —, Voet, J., & Krassnoff, D., 380.
—, & Schoen, R., 74, 177, 180.
—, —, & Reinié, L., 600.
Levenson, S., 253.
Levin, B. S., & Lominski, I., 178, 179.
Levine, P. P., 353.
Lévy-Bruhl, M., & Cado, Y., 248.
Lewis, T., 445.
Lewzow, I. See Isabolinski, M., et al., jt. authors, 117.
Lhoste, A., 304.
Lieb, C. W. See Chapman, G. H., jt. author, 566.
Liebsch, E., 628.
Lightfoot, C. C. See Huffman, C. F., et al., jt. authors, 252.

Lignières, R., 469.
Lindström, B. See Henricsson, E., jt. author, 110.
Lins de Almeida, J. See Teixeria de Freitas, J. F., jt. author, 474.
Lisbonne, M., & Roman, G., 10.
—, & Seigneurin, R., 10.
—. See also Merliac, L., jt. author, 213.
Lloyd, B. J., 392.
Locke, R. C., 145.
Lockett, S., 501.
Lombard, C., 240.
Lominski, I. See Levin, B. S., jt. author, 178, 179.
Lopez, C., 184.
—, Lajo, T. V., & López, F., 172.
—, Steiner, A., & Gordón, S., 277.
López, F. See López, C., et al., jt. authors, 172.
Lossev, L., 612.
Loukidis, E., 234.
—, & Kielanowski, T., 156.
Lourie, E. M., & O'Connor, R. J., 274.
Lovell, R., 515.
Lowe, H. J., 649.
Lubbehusen, R. E., & Beach, J. R., 532.
—, —, & Busci, W. H., 332.
Lucas, A. M., 534.
Lütje, 257, 266.
Lukasiak, J., 24.
Lund, L., 30.
Lurie, M. B., 233.
Lush, D. See Burnet, F. M., jt. author, 532.
Lutrario, A., 34.

M

McClean, D., 289.
McCordock, H. A., & Smith, M. G., 534.
McCrady, McH. See Breed, R. S., et al., jt. authors, 490.
McCrory, B. R., & Ward, J. C., 136.
McCulloch, E. C., & Costigan, S., 210.
McCulloch, R. N., Howe, K. R., & Hockley, J., 383.
Macek, K., 18.
McEwen, A. D., & Roberts, R. S., 61.
McGrath, C. B. See van Es, L., jt. author, 573.
McGuire, J. P. See Covell, G., et al., jt. authors, 330.
Machattie, C., 282.
Macheboeuf, M. See Basset, J., et al., jt. authors, 583.
McIntosh, R. S. See Graham, W. R., Jr., et al., jt. authors, 494.
Mackay, A. A. See Blampied, T. Le Q., jt. author, 614.
Mackay, I. See Kennedy, W. P., jt. author, 139.
McKay, K. G., 459.
Mackenzie, R. D., & Findlay, G. M., 605.
—, —, & Stern, R. O., 426.
—. See also Findlay, G. M., jt. author, 605.
Mackerras, I. M., 429.
—, Fuller, M. E., & Austin, K. M., 382.
McKinley, E. B., 237.
McKinnon, R. M. See Horgan, E. S., jt. author, 600.
MacLanahan, M. See Kabler, P., jt. author, 110.
Maclean, 13.
MacLeod, J., 181, 527, 537.
McMahon, J. P. See Symes, C. B., jt. author, 607.
MacNabb, A. L., 632.
—, & Brown, M. H., 104.
MacNalty, A. S., 502.
MacNamee, J. K., 302.
McNaught, K. J., 297.
McNeil, E. See Kofoid, C. A., et al., jt. authors, 635.
McOmie, W. A. See Salle, A. J., jt. author, 620.
Macsween, J. C. See O'Meara, R. A. Q., jt. author, 314.
Maddock, E. C. G., 361.
Madsen, D. E., Knowlton, G. F., & Rowe, J. A., 175.
Madsen, M. L., 589.
Magenta, B., 366.
Magrou, J. See Hauduroy, P., jt. author, 561.
Maignon, F., 79, 233, 431.
Maitland, M. L. C., 633.
Majboreda, A. A. See Gurvic, B. M., et al., jt. authors, 18.
Majoewsky, W. H. F. C., & Tuenter, J. P. A., 84.
Malensek, S. See Hupbauer, A., jt. author, 175.
Malkani, P. G., 623.
Malkmus, B., 504.
Mallari, A. I. See Mallari, M. V., jt. author, 57.
Mallari, M. V., & Mallari, A. I., 57.
Mallmann, W. L., & Moore, J. M., 210.
Maly, F., 493.
Manninger, R., 58, 108, 208, 264, 279.
—, & Marcis, A., 599.
Manresa, M., & Gonzalez, B. M., 375.
—, & Mondonedo, M., 603.
Mansfield, J. S. See Freund, J., et al., jt. authors, 390.
Manz, W., 545.
Mapleston, O. A., & Mukerji, P. K., 494.
Marayew, P. W. See Tscherniak, W. Z., et al., jt. authors, 323.
Marcato, A., 622.
March, R. S. See Roch, M., et al., jt. authors, 219.
Marcis, A., 478.
—. See also Manninger, R., jt. author, 599.
Marek, J., 151.
Margani, G., 11.
Markham, F. S., & Hudson, N. P., 534.
Markoff, A. A., 164.
Marotel, 281, 300.
Marsh, H., 284.
—. See also Butler, W. J., et al., jt. authors, 108.
—. See also Tunicliff, E. A., jt. author, 109.
Marshall, C. J., 511, 544.
Marshall, D., 82.
Marteau, P. See Millischer, P., jt. author, 424.
Martin, C. J., 118, 180.
Martin, J. A. See Morris, H., et al., jt. authors, 170.
Martini, I., 224.
Mascaró Garcia, D. F., 593.
Mason, E., & Waters, D. F., 143.
Mason, J. H., & Scheuber, J. R., 582.
Massey, A. B., & Snider, G. E., 104.
Maternowska, I., 350.
Matoff, K., 232, *bis*, 337.
Matschoulsky, S. N. See Yakimoff, W. L., et al., jt. authors, 15, 327.
Matsumura, T., 75.
Matthews, H. T., 208.
Mattick, A. T. R., & White, P., 362.
Mattick, E. C. V., & Golding, J., 252.
Mattinson, A. B., 208.
Maurice, H. See Sokhey, S. S., jt. author, 616.
Mavridis, N. See Kolayli, C., et al., jt. authors, 392.
Maw, W. A., Whitehead, W. E., & Bemont, L. H., 123.
Mayer, K. F., 286.
Mazel, M., 88.
Mazzeo, M., 550.
Meanwell, L. J. See Anderson, E. B., jt. author, 490.
Medlar, E. M., & Sasano, K. T., 569.
—. See also Sasano, K. T., jt. author, 248.
Mégemont, A., 339.
Megyaszai, G., 455.
Meirheaghe. See Ferauge, jt. author, 126.
Mélanidi, C., & Tzortzaki, N., 534.
Mellanby, H., 334.
Mellanby, K., 334.
Menager, J. See Cordier, G., et al., jt. authors, 167.
Menkin, V., 340.
Menzani, C. See Bardelli, P., jt. author, 250.
Merliac, L., & Lisbonne, M., 213.
Mesnil, F., Leger, M., & Pérard, C., 215.
Mespoulet, R., Lemétayer, E., & Bardot, C., 371.
Mesrobeanu, L., 615.
—. See also Boivin, A., jt. author, 187, 288.
—. See also Ciuca, M., et al., jt. authors, 9.
Messieri, A., 409.
Mestrallet, A. See Durand, P., et al., jt. authors, 219, *bis*.
Mestre, H., 143.
Mészáros, I., 464.
Metivier, H. V. M., 204.
Mettam, R. W. M., 498.
—, & Carmichael, J., 169.
Metzger, H. J., 241.
Metzulescu, A., & Czickeli, H., 509.
Meyer, 345.
Meyer, A. R. See Uhl, E., et al., jt. authors, 333.
Meyer, D. B. See Bryan, C. S., jt. author, 136.
Meyer, K., 127, 235, 236.
Meyer, K. F. See Veazie, L., jt. author, 110.
Meyer, R., 351.
Meyer, R. K. See Gustus, E. L., et al., jt. authors, 88.
de Meza, J., 651.
Michael, V. M. See Graham, R., jt. author, 451.
Michalka, J., 548.
Michelazzi, L., 614.
Michin, N. A., & Azinov, S. A., 419.
Miegeville, H. See Velu, H., et al., jt. authors, 636.
Miessner, 267, 344.
Miessner, H., & Berge, R., 341.
—, & Harms, F., 289.
—, & Schoop, G., 58, 521.

Miessner, J., & Hansen, K., 14.
Migliavacca, L., 368.
Miles, A. A. See Aitken, R. S., et al., jt. authors, 322.
Milian, & Karatchentzeff, 162.
Milks, H. J., 504.
Millauer, K., 302.
Miller, A. P., 552.
Miller, E. G., Jr. See Kurzok, R., et al., jt. authors, 492.
Miller, E. J. See Duncan, C. W., jt. author, 641.
Miller, F. W. See Andrews, J., jt. author, 325.
Miller, W. C., 121.
—, & Robertson, E. D. S., 152.
Miller, W. T., 311.
Millischer, A. See Millischer, P., jt. author, 425.
Millischer, P., & Marteau, P., 424.
—, & Millischer, A., 425.
Milne, P. S. See Williams, C. B., jt. author, 182.
Minett, F. C., 508.
—. See also Wilson, G. S., et al., jt. authors, 643.
Minkewitsch, I. E., & Rabinowitsch, D. J., 516.
Mistorigo, R., 195.
Mitchell, H. H., 135.
Mitchell, W. M., 435.
Miyamoto, Y., & Shimazaki, T., 569.
Mizkewitsch, W. J. See Yakimoff, W. F., et al., jt. authors, 15, 67.
Mlinac, F., & Oswald, B., 334, *bis*, 535.
Mlynár, J., 64.
Moberg, E., 400.
Mócsy, J., 601.
von Mocsy, J., 547.
Modes, E., 87.
Moen, J. K., 390, 542.
—, & Swift, H. F., 390.
Mönnig, H. O., 247.
Moggridge, J. Y., 229, *bis*.
Mohler, W. M. See Gochenour, W. S., et al., jt. authors, 259.
Mohs, H., 118.
Moine, G., 241, *bis*.
Moiseev, S. B. See Glembockij, J. L., jt. author, 630.
Molodova, P. See Bezsonova, A., et al., jt. authors; 577.
di Monaco, F., 446.
Mondonedo, M. See Manresa, M., jt. author, 603.
Monteverde, G., 482, *bis*.
Montgomerie, R. F., & Rowlands, W. T., 51, 110, 432, 581.
Monti, D., & Bordiga, R., 446.
Moore, F. L. See Hoyt, A., et al., jt. authors, 471.
Moore, J. M. See Davidson, W. T., et al., jt. authors, 465.
—. See also Mallmann, W. L., jt. author, 210.
Moorthy, V. N., 647.
Morcos, Z., 163.
—, & Hosny Mahmoud, A., 58.
Morel, A., Rochaix, A., Perrot, L., & Moutou, M., 248.
—, —, —, & Pegon, A., 248.
Moretti, B., 459.
Morgan, D. O. See Newbigin, H. F., jt. author, 353.
Morgan, F. G., & Craydon, J. J., 288.
Morgan, M. T., 488.
Morgan, T. N., 638.
Morimoto, T. See Murao, K., jt. author, 392.
Morosov, M. A., 331, *bis*.
Morosowa, F. M. See Weissfeiler, J., jt. author, 316.
Morris, H., Martin, J. A., & Oglesby, W. T., 170.
Morris, J. P. A., 149.
Morris, S., 450.
Moscrip, W. S., 459.
Mosolova, O. See Bezsonova, A., et al., jt. authors, 577.
de Moulin, F. W. K., 257.
Moulthrop, I. M. See DeVolt, H. M., et al., jt. authors, 532.
Moureu, A. See Weinberg, M., et al., jt. authors, 581.
Mouriquand, C., Leulier, A., & Coeur, A., 83.
Moutou, M. See Morel, A., et al., jt. authors, 248.
Moutovine, V., 72.
Moxon, A. L. See Franke, K. W., et al., jt. authors, 137, 443.
Mueller, A., 219.
Müller, J. See Götze, R., jt., author, 25, 264.
Mueller, J. F., 385.
Müssemier, & Hofferber, 653.
Müssemeier, F., 195.
Muir, W. R., 296.
Mukerji, P. K. See Mapleston, P. A., jt. author, 494.
Muniz, J. See Regendanz, P., jt. author, 428.
Munro, S. S., 543.
Murao, K., & Morimoto, T., 392.
Murphy, E. F., 135.
Murray, C., 530.
—. See also Lee, C. D., et al., jt. authors, 210.
—. See also Schwarte, L. H., et al., jt. authors, 623.
Murray, R. H., 490.
Mussill, J., 464.
Muth, O. H. See Shaw, J. N., jt. author, 551.
Myburgh, S. J., 142.
Myers, R. P. See Breed, R. S., et al., jt. authors, 490.

N

Nagakura, Y., & Aggarwala, A. C., 450.
Nagórski, F. See Stefanski, W., jt. author, 232.
Naik, R. N., 531.
Naito, T., & Oka, S., 442.
Nal, D. D., 628.
Nattan-Larrier, L., & Dufour, J., 274.
Nayar, P. U., & Srikantaiah, G. N., 595.
Nedelkovitch, J., 157.
Needham, J., 297.
Nègre, L., & Bretey, J., 260.
—, Valtis, J., & Bretey, J., 260.
Neitz, W. O., 601.
Nelson, J. B., 519, *bis*.
Nelson, V. E. See Biester, H. E., et al., jt. authors, 301.
Nelson, W. O., 197.
Neter, E., & Witebsky, E., 313.
Neumann, H. See Schilling, G., et al., jt. authors, 586.
Neumann-Kleinpaul, K., & Tabbert, B., 623.
Neveu-Lemaire, M., 206.
Newbigin, H. F., & Morgan, D. O., 353.
Newman, M. S. See Anderson, R. J., et al., jt. authors, 56.
Newsom, I. E., 508.
—, & Cross, F., 548.
—, Stout, E. N., Thorp, F., Jr., Barber, C. W., & Groth, A. H., 641.
Newton, W., & Edwards, H. I., 619.
Nezwetaieff, N. W. See Yakimoff, W. L., et al., jt. authors, 247.
Nichols, A. A., & Edwards, S. J., 362, 488.
Nichols, V. C. See Krueger, A. P., jt. author, 79.
Nicholson, J. A., 160.
Nicolas, E., 249.
Nicolau, S., & Kopciowska, L., 74, 177, *bis*, 178.
Nicolle, C., 305.
Nicolle, P., 163.
Nicolski, N. M., 90.
Nieberle, K., 510.
Niebur, H., 325.
Nieder, H. J. See Lerche, M., et al., jt. authors, 549.
Niedoba, T. See Keller, K., jt. author, 629.
Nielsen, M., 495.
Nicmes, B., 642.
Nikolaev, V. A., 263.
Nikolsky, S. N., 15.
Nitti, F., & Bovet, D., 299.
—. See also Fourneau, E., et al., jt. authors, 299.
Noel, G. See Pergher, G., jt. author, 461.
Nohmi, S., Katow, M., & Karasawa, S., 579.
Nohrman, G., 298.
Noskov, A. I., 18.
Nothdurft, G. See Ritter, H., jt. author, 455.
Nouvel, J. See Urbain, A., et al., jt. authors, 139.
Nowicki, R., 68.
Nungester, W. J., Jourdonais, L. F., & Wolf, A. A., 64.

O

Obitz, K., 382.
—. See also Stefanski, W., jt. author, 382.
Obrtel, J., 346.
Ochoa, M. M. See Strong, R. P., et al., jt. authors, 231.
O'Connor, R. J. See Lourie, E. M., jt. author, 274.
Oerskov, J., Hansen, A., & Schmidt, S., 421.
—, & Schmidt, S., 228.
—. See also Hansen, A., et al., jt. authors, 329.
—. See also Schmidt, S., et al., jt. authors, 228, 329.
Oesterlin, M., 440, 636.
Oglesby, E. W. See Tanner, F. W., jt. author, 582.
Oglesby, W. T. See Morris, H., et al., jt. authors, 170.
van Oijen, C. F., 492.
Oka, S. See Naito, T., jt. author, 442.
Okkels, H., 255.
Okland, F. See Amundsen, H., jt. author, 24.
Okljesa, B., & Tomasec, I., 100.
Okumura, Y. See Torikata, R., jt. author, 105.
Olitsky, P. K., Sabin, A. B., & Cox, H. R., 377.
—. See also Cox, H. R., jt. author, 175.
—. See also Sabin, A. B., jt. author, 391.
Olitzki, L. See Kligler, I. J., jt. author, 271.
Oliver, A., 422, 648.
Olsen, C., Jr., & Feldman, W. H., 156.

Olsen, M. W. See Byerley, T. C., jt. author, 189.
Olsson, E., 621.
O'Meara, R. A. Q., & Macsween, J. C., 314.
Ono, S., 281.
Oppermann, T., 27, 360, 396, 481.
Orechowitsch, W. N., 645.
Orlandini, C., 369.
Orskov, J., & Kauffmann, F., 288.
Ortlepp, R. J., 541.
Osterhage, K. H., 315.
von Ostertag, R, 496.
Osterwalder, H. See Krupski, A., jt. author, 76.
Ostrovskaya, S. M. See Smorodintseff, A. A., jt. author, 91.
Oswald, B. See Mlinac, F., jt. author, 334, *bis*, 535.
Otake, S. See Kambayashi, T., jt. author, 65.
Ott, G. L. See Herrick, C. A., et al., jt. authors, 270, *bis*.
Otten, L., 392.
Overbeek, A. A., 258.
Oxer, D. T., 111.
Oxspring, G. E., 260.

P

Pacchioni, G. See Lanfranchi, A., jt. author, 368.
Pacheco, G. See Rodrigues, C., jt. author, 268.
Pagnini, U., 509.
Paic, M. See Levaditi, C., et al., jt. authors, 178, 380, 470.
Paille, R., 268.
Painter, E. P., & Franke, K. W., 137, *bis*.
—. See also Franke, K. W., jt. author, 136, 137.
Pallaske, G., 192.
Palmer, L. S. See Gullickson, T. W., et al., jt. authors, 191.
Paltrinieri, S., 367, 410, 411.
Pangborn, M. C. See Crowder, J. A., et al., jt. authors, 56.
Panisset, L., 115, 402.
—, & Jalabert, E., 2.
—, & Pflieger, C., 222.
Pannier, R., 274.
Papadakis, G. See Tzortzakis, N., jt. author, 536.
Papadaniel, 541.
Pappenheimer, A. M. See Goettsch, M., et al., jt. authors, 399, 548.
Paredes, A., 430.
Parker, T. P., 145.
Parnell, I. W., 284, 539.
Parnes, J., 349.
Parrot, L. See Sergent, Ed., et al., jt. authors, 156, 590.
Paschen, E., 605.
Pasquier, M. A. See Urbain, A., et al., jt. authors, 139.
Passerini, 224.
Pasternack, J. G., & Bengston, I. A., 414.
Patriat, 465.
Patrizi, F., 366.
Pawan, J. L., 528.
Pearce, L., Rosahn, P. D., & Hu, C. K., 278, *bis*, 279.
—. See also Hu, C. K., jt. author, 278.
—. See also Rosahn, P. D., jt. author, 278, *ter*.
Pearson, A. M., 441, 492.
Pearson, P. B., & Catchpole, H. R., 251, *bis*.
Pebrova, V. V. See Friedman, A. P., et al., jt. authors, 115.
Peck, E. F., 44.
Pedersen-Bjergaard, K., & Glud, P., 140.
Peel, E. See van Hoof, L., et al., jt. authors, 585.
Pegon, A. See Morel, A., et al., jt. authors, 248.
Pelletier, L. See Carpentier, G., jt. author, 537.
Penfold, H. B. See Penfold, W. J., et al., jt. authors, 123, 124, 610, 611.
Penfold, H. D. See Penfold, W. J., et al., jt. authors, 335.
Penfold, W. J., & Penfold, H. B., 123, 611.
—, Penfold, H. B., & Phillips, M., 123, 124, 610.
—, Penfold, H. D., & Phillips, M., 335.
Penquite, R. See Heller, V. G., jt. author, 192.
Penso, G., 219.
Peragallo, I., 448, 567.
Pérara, C. See Mesnil, F., et al., jt. authors, 215.
Perdrau, J. R., & Todd, C., 533.
Pérès, G., & Granon-Fabre, P., 413.
Pérez Pardo, J., 84.
Pergher, G., & Noel, G., 461.
Perini, P. E., 448.
Pernot, P. See Balozet, L., jt. author, 323.
Perrot, L. See Morel, A., et al., jt. authors, 248.
Peruzzi, M., 463.
Peter, F. M. See Schmidt, H., jt. author, 505.
Peters, 346.
Peters, B. G., 537.
Peters, R. A., 135.
Petersen, G., 413.
Petersen, W. W., 131.
Petrych, J., 39.
Petterson, A., 25.
Pezzangora, F., 569.
Pfandler, L., 394.
Pflieger, C. See Panisset, L., jt. author, 222.
Philipson, J., 78.
Phillips, M. See Penfold, W. J., et al., jt. authors, 123, 124, 335, 610.
Phillips, R. W., & Andrews, F. N., 141.
Piasecka-Zeyland, E. See Zeyland, J., jt. author, 569.
Pickels, E. G. See Bauer, J. H., jt. author, 449.
—. See also Biscoe, J., et al., jt. authors, 198.
Pico, R., 376.
Piening, C., 28, 128.
Pierce, C. C., 33.
Pilipenko, M. A. See Kolomietz, J. S., jt. author, 466.
Pillay, M. R. See Rao, M. A. N., jt. author, 382.
Pillers, A. W. N., 144.
Pilod, M. See Sacquepée, E., et al., jt. authors, 188.
Pilot, I., Buck, C., Davis, D. J., & Eastman, D. A., 312.
Pinkerton, H., 113.
Pinner, M., 107.
Pisa, A., 86.
Pisarev, E. See Kapitanaki, M., et al., jt. authors, 115.
Pistelli, F., 80.
Plaizkovski, U., & Svensson, S., 552.
Plastridge, W. N., & Anderson, E. O., 312.
Plastridge, W. N., Anderson, E. O., Weirether, F. J., & Johnson, R. E., 311.
Platt, A. E., 109, 286, 314.
Plotz, H., 178, *bis*.
Plum, N., 104, 154, 207, 410, 434.
—. See also Benson, K., et al., jt. authors, 630.
—. See also Egehoj, J., jt. author, 103.
—. See also Faulenborg, G., jt. author, 154.
—. See also Jensen, B. H., et al., jt. authors, 431.
Pocecuev, K. N., 463.
Pochon, J., 370.
Poelma, L. J. See Everson, C. L., et al., jt. authors, 412.
Pötting, 49.
Pogonajlo, G. F. See Friedman, A. P., et al., jt. authors, 115.
Pogorely, A. I., 181.
Pohlmann, R. See Schlossberger, H., jt. author, 171.
Poindexter, H. A., & Bennet, R. I., 163.
Poisson, H., 434.
—, & Buck, G., 387.
Pojer, G., 29.
Pokorny, V., 17.
Polding, J. G., 579.
Poley, W. E. See Franke, K. W., et al., jt. authors, 137.
Poltyreff, S. S., Tscheredkoff, W. N., Gurewitsch, D. I., & Egoroff, S. W., 644.
—, —, —, & Wyssotzky, 644.
Ponsford, A. P. See Stewart, W. L., jt. author, 397.
Pooman, A., 401.
Popescu, F., 298.
Popov, A. A., 627.
Poppe, K., 266.
—, & Busch, G., 527.
Porter, D. A., 337.
Portman, K. See Benson, K., et al., jt. authors, 630.
Posrednik, F. J. See Laktionov, A. M., jt. author, 2.
Postel, W., 638.
Potter, van R. See Franke, K. W., jt. author, 356.
Potts, W. H., 608.
Poulton, W. F., 497.
Poursines, Y., Soulie, P., & Scandarani, T., 66.
Pouska, 438.
Pribyl, E., 400.
Price, E. W., 610.
Priestley, F. W., 514, 515.
Prieur, M. See Launoy, L., et al., jt. authors, 218.
Prigge, R., 415, 432.
Pröger, K., 481.
Pröscholdt, O., 264, 457, 477, 513.
Prokhoroff, A. V., 8.
Protasen, T. P., 82.
Pullar, E. M., 122.
Purvis, G. V., 467.
Pyl, G., & Klek, L., 420.
—. See also Waldmann, O., et al., jt. authors, 596.

Q

Quaedvlieg, E. J. A. A., 245.
Quarante, A. See Valade, P., jt. author, 240.
de Queiroz Lima, E. See Torres, S., jt. author, 601, *bis*, 602.
Quin, J. I. See Besselaar, H. J., jt. author, 86.
Quirke, T. F., 558.
Quittek, G., 493.

R

Rabagiati, D. S., 350, *bis*.
—. See also Davenport, C., et al., jt. authors, 544.
Rabinov, L. See Ross, F. C. H., jt. author, 119.
Rabinowitsch, D. J. See Minkewitsch, I. E., jt. author, 516.
Rafael Colmenares, C., 612.
Rahim-ud-Din, M., 173, *bis*, 468.
Raistrick, H. See Topley, W. W. C., et al., jt. authors, 616.
Rajagopalan, V. R., 573, 605.
Ramon, G., 188.
—, Richou, R., & Djourichitch, M., 187, *bis*, 288.
—, & Staub, A., 153, 154.
Rao, M. A. N., & Pillay, M. R., 382.
Rastegaeva, A. M., 75.
Rastegaeva, E. F., 607.
Rastégaieff, E., 181, *bis*.
Rastegaieff, E. F., Timofeeff, P. S., & Matschulsky, S. N., 164.
—. See also Yakimoff, W. L., et al., jt. authors, 15, 247.
Rastegajeff, E. P. See Gousseff, W. F., et al., jt. authors, 591.
Rath, M., 389.
Ratner, L. S., 599.
Rautmann, H., 456.
Ravaglia, F., 390.
Ravich-Birger, E. D. See Epstein, G. W., et al., jt. authors, 157.
Raw, N., 562.
Rawlings, W. B., & Hottle, G. A., 371.
Raybaud, A., 576.
Records, E., 598.
Rees, C. W., & Hale, M. W., 327.
Refuerzo, P. G. See Africa, C. M., et al., jt. authors, 387.
Regendanz, P., 418.
—, & Muniz, J., 428.
Reichel, J., & Schneider, J. E., 177.
Reichle, H. S., & Gallavan, M., 514.
Reid, W. M. See Ackert, J. E., jt. author, 183.
Reinié, L. See Levaditi, C., et al., jt. authors, 600.
Reis, J., 127.
Reiter, 33.
Remlinger, P., & Bailly, J., 74, 175, 423, *bis*, 424, 471, 529, *ter*.
Reymann, G. C. See Walbum, L. E., jt. author, 322.
Reyna, J. L., 257.
Rhines, C., 6.
Rich, A. R., 340.
Richou, R. See Ramon, G., et al., jt. authors, 187, *bis*, 288.
Richter, J., 38, 346, 659.
Richters, C. E., 563.
Riddle, O. See Kurzok, R., et al., jt. authors, 492.
Riedel, 576.
Riedmüller, L., 464.
Rietz, J. H., 551.
Riley, P. B., 556.
Rimington, C., 548.
Rinjard, P., & Vallée, M., 572.
Rislakki, V. See Thomsen, A., jt. author, 9.
Ritchie, J. E. See Fraser, A. H. H., et al., jt. authors, 284, *bis*.
Ritter, H., & Nothdurft, G., 455.
Rivers, T. M., 473, 525, *bis*.
Robb, W., 435.
Roberts, F. H. S., 119, *sex*, 121, 384.
Roberts, R. S., 543.
—. See also McEwen, A. D., jt. author, 61.
Robertson, D. See Fraser, A. H. H., et al., jt. authors, 284, *bis*, 608.
Robertson, E. D. S. See Miller, W. C., jt. author, 152.
Robertson, W. A. N., 34.
Robic, J. See Girard, G., jt. author, 392.
Robinson, E. M., 213.
—. See also de Kock, G., jt. author, 227, 603.
Robles, M. M., 595.
Roch, M., Demole, J. M., & March, R. S., 219.
Rochaix, A. See Morel, A., et al, jt. authors, 248.
Rochwell, G. E., & van Kirk, H. C., 288.
Roderick, L., Harshfield, G. S., & Hawn, M. C., 485.
Rodhain, J., & Henry, E., 273.
Rodionov, I. M., 598.
Rodrigues, C., & Pacheco, G., 268.
Roe, R. J., 306.
Roeland, C., 34.
Rogers, C. F., & Boyd, W. L., 138.
Roman, G. See Lisbonne, M., jt. author, 10.
Romano, R., 198.
van Rooyen, C. E., 462.
Rosahn, P. D., Hu, C. K., & Pearce, L., 278, *bis*.
—. See also Hu, C. K., jt. author, 278.
—. See also Pearce, 278, *bis*, 279.
del Rosariom, F., 474.
Rose, A. L., 139, 372.
Rose, S. B., Rose, W. B., & Kolmer, J. A., 160.
Rose, W. B. See Rose, S. B., et al., jt. authors, 160.
Rosell, J. M., 311.
Rosenwald, A. S., 122.
Ross, F. C. H., & Rabinov, L., 119.
Ross, I. C., & Gordon, H. McL., 205.
—. See also Gordon, H. McL., jt. author, 441.
Rossi, P., 161, 466, 529.
Roth, H., 125, *bis*.
Roubaud, E., 416.
—, & Colas-Belcour, J., 182, 215.
Rountree, P. M., 257.
Rous, P., Kidd, J. G., & Beard, J. W., 331, *bis*.
—. See also Kidd, J. G., et al., jt. authors, 180, 380.
Rousseau, L., 76.
le Roux, P. L., 150.
Rowe, J. A. See Madsen, D. E., et al., jt. authors, 175.
Rowlands, I. W., & Singer, E., 33.
Rowlands, W. T. See Montgomerie, R. F., jt. author, 51, 110, 432, 581.
Rubarth, S., 395.
Rubinstein, P. L., 78.
Ruddock-West, T., 634.
—, & Alpe, F. T., 362.
Ruiz Martinez, C., 518.
Rushe, H. A., 9.
Ruys, C. A., 572.
Ruzicka, J., 195.

S

Sá Viana Conte, H., & Belo, M. M. A., 613.
Sabin, A. B., & Olitsky, P. K., 391.
—. See also Olitsky, P. K., et al., jt. authors, 377.
Saborido, J., 639.
van Saceghem, R., 322.
Sachweh, 464.
Sacquepée, E., Pilod, M., & Jude, A., 188.
Sadettin, M. See Saenz, A., jt. author, 107.
Saenz, A., 156, 233, 234, *bis*, 475, 571.
—, & Costil, L., 6.
—, —, & Sadettin, M., 107.
Sahai, L., 531.
St. John-Brooks, R. See Breed, R. S., jt. author, 64.
Saint-Prix, M., 90.
—. See also Berny, P., jt. author, 76.
Salaman, R. N., 593.
Salfeld, H., & Weichsel, M., 619.
—. See also Weichsel, M., jt. author, 619.
Salgues, R., 83.
Sallam, H. A. See Sandiford, B. R., et al., jt. authors, 351.
Salle, A. J., & McOmie, W. A., 620.
Salomon, S., 128.
Salord, C. See Lestoquard, F., et al., jt. authors, 16.
Salsbery, C. E., 548.
Sampson, J., & Hayden, C. E., 241.
Sanchez, E. L., 612.
Sanders, D. A., Shealy, A. L., & Emmel, M. W., 138.
Sandground, J. H. See Strong, R. P., et al., jt. authors, 231.
Sandiford, B. R., Ali, M., & Sallam, H. A., 351.
Sandomirskij, J., & Cernomirdik, A. B., 401.
Sandor, G., 388.
—. See also Boquet, A., jt. author, 613.
Santoni, L., 142.
Sarkissoff, A. K. See Zuwerkalow, D. A., jt. author, 126.
Sarnowiec, W., 186, 549.
Sasano, K. T., & Medlar, E. M., 248.
—. See also Medlar, E. M., jt. author, 569.
Sathou, C. See Velu, H., et al., jt. authors, 212.
Saunders, P. T., 557.
Saxer, E., 61.
Sayama, K. See Hirano, N., jt. author, 533.
Scandarani, T. See Poursines, Y., et al., jt. authors, 66.
Scerbinin, I. V. See Sudzilovzkij, M. N., jt. author, 376.
van der Schaaf, A. T. See Bijl, J. P., jt. authors, 427.
Schaaf, J., 319.
Schaefer, W., 103, 154.
Schäper, W., 50.
Schalm, O. W., & Beach, J. R., 7, 262.
—. See also Beach, J. R., jt. author, 22, 262.
Schambouroff, D. A., & Belikowa, O. P., 287.
Schapiro, M. M., 611.
Schartum-Hansen, H., 449.
Scheff, G., & Hasskó, A., 246.
Scheibe, H., 141.

Schermer, S., 192.
—, & Kaempffer, A., 480.
Schern, K., 102.
Scheuber, J. R. See Mason, J. H., jt. author, 582.
Scheuer, F., 71.
Schilling, C., 375, 416.
Schilling, G., 586, *bis*.
—, & Schreck, H., Neumann, H., & Kunert, H., 586.
Schlossberger, H., & Pohlmann, R., 171.
Schlotthauer, C. F., 546.
Schlüter, W., & Schmidt, H., 565.
Schluter, W., 317.
Schmaltz, 596.
Schmaltz, R., 403.
Schmid, F., 230, 433.
Schmidt, G. W. See Doerr, R., et al., jt. authors, 218.
Schmidt, H., 419, 565, *bis*.
—, & Peter, F. M., 505.
—. See also Schluter, W., jt. author, 565.
Schmidt-Hoensdorf, Schünemann, & Hundhammer, 244.
Schmit-Jensen, H. O., Schmidt, S., & Hansen, A., 329, 420.
Schmidt, J. S., 253.
Schmidt, S., 17, 328, 421, *bis*, 468.
—, & Hansen, A., 16, 17, 420, 469.
—, Oerskov, J., & Hansen, A., 329.
—, —, & Steenberg, E., 228.
—, & Steenberg, E., 371.
—. See also Hansen, A., et al., jt. authors, 17, 329.
—. See also Oerskov, J., et al., jt. authors, 228, 421.
—. See also Schmit-Jensen, H. O., et al., jt. authors, 329, 420.
Schmidt, W., 244, 253, 526.
Schmidt-Lange, W., 207.
Schmitz, J. See Grillo, H., jt. author, 636.
Schnabel, H., 293.
Schneider, J. E. See Reichel, J., jt. author, 177.
Schneider, L., & Szathmáry, J., 619.
Schneiter, P. See Weinberg, M., jt. author, 448.
Schoen, R. See Levaditi, C., et al., jt. authors, 74, 177, 180, 600.
Schoenaers, F. See Bertrand, G., jt. author, 578.
Schoening, H. W., 74.
—. See also Gochenour, W. S., et al., jt. authors, 259.
Schofield, F. W., 356.
Schoop, G., 225, 343, 357.
—, & Dedié, K., 538.
—. See also Miessner, H., jt. author, 58, 521.
Schornagel, H., 492.
Schramm, W., 139.
Schreck, H. See Schilling, G., et al., jt. authors, 586.
de Schryver, A., 4.
Schudel, L., 564.
Schüffner, W. A. P., & Walch-Sorgdrager, B., 593.
Schünemann. See Schmidt-Hoensdorf, et al., jt. authors, 244.
Schütze, H., Gorer, P. A., & Finlayson, M. H., 237.
Schultze, E., 267.
Schulz, E. E. S. See Skriabine, K. I., jt. author, 337.
Schumann, 325, 455, 481.
Schutte, D. J., 38.
Schuurman, C. J., & Schuurman-ten Bokkel Huinink, A. M., 75.
Schuurman-ten Bokkel Huinink, A. M. See Schuurman, C. J., jt. author, 75.
Schwardt, H. H., 537.
Schwarte, L. H., Biester, H. E., & Murray, C., 623.
Schwartzer, K. See Kairies, A., jt. author, 317.
Schwarzmaier, E., 321.
Schweinburg, F. See Gerlach, F., jt. author, 599.
Schwieger, H., 399.
Scorgie, N. J. See Stableforth, A. W., et al., jt. authors, 463.
Scott, J. A., 610.
Scott, J. P. See Frank, E. R., jt. author, 321.
Secord, A. C., 483.
Seddon, H. R., 112, 383.
Seekles, L. See Sjollema, B., jt. author, 638.
Seelemann, M., 244.
—, & Wolf, C. H., 354.
—, —, & von Gartzen, M., 549.
Seffert, H. See Siebert, W. W., jt. author, 543.
Seguy, E., 429.
Seifried, O., 133, 309.
—. See also Krembs, J., jt. author, 345.
Seigneurin, R. See Lisbonne, M., jt. author, 10.
Selter, H., & Weiland, P., 25.
Selye, H., 399.
Sen, S. K., 272.
—, & Srinivasan, M. K., 592.
Senior, B. J. See Sheehy, E. J., jt. author, 296.
De Sequeira, L. A. F., 215.
Sergent, Ed., 309.
—, Donatien, A., Parrot, L., & Lestoquard, F., 167, 590.
Sevcik, F., 316.
Shaw, J. N., & Muth, O. H., 551.
Shaw, R. M., & Simpson, G. S., 161.
Shealy, A. L. See Sanders, D. A., et al., jt. authors, 138.
Sheehy, E. J., & Senior, B. J., 296.
Sherman, J. M. See Hodge, H. M., jt. author, 507.
—. See also Stark, P., jt. author, 257.
Sherwood, R. M., & Fraps, G. S., 442, *bis*.
Shibuya, Y. See Toyoshina, T., jt. author, 574.
Shier, F. L. See Underwood, E. J., jt. author, 269.
Shillinger, J. E., 483.
—. See also Green, R. G., et al., jt. authors, 176, 472.
Shimazaki, T. See Miyamoto, Y., jt. author, 569.
Shope, R. E., 472, 606.
—, & Francis, T., Jr., 226.
Shorten, H. L. See Davis, C. L., jt. author, 189.
Shortt, H. E., 166, 588.
Shute, E., 32.
Siebert, W. W., & Seffert, H., 543.
Siegert, 378.
Sienczewski, S., 32.
Sievert, L., 414, 519.
Sifmanovic, G. I., 91, 308.
Simitch, T. V., & Djourichitch, M., 462.
—, —, & Solonska, L., 188.
Simmins, G. B. See Gilbert, S. J., jt. author, 117.
Simmonet, H., 506.
Simonatti, E., 376.
Simonelli, A., 184.
Simpson, G. S. See Shaw, R. M., jt. author, 161.
Singer, E., 635.
—. See also Rowlands, I. W., jt. author, 33.
Singh, B., 272.
Sjollema, B., 553.
—, & Seekles, L., 638.
Skriabine, K. I., & Schulz, E. E. S., 337.
Slatineanu, A., Balmus, G., & Balmus, P., 417.
Slecer, A. M. See Belkin, G., jt. author, 124.
Smanenkov, N. A., & Ivanov, N. F., 391.
Smith, A. D. B., 450.
Smith, H. R., 511.
Smith, J. A. B., 449.
Smith, J. M., 452.
Smith, M. G. See McCordock, H. A., jt. author, 534.
Smith, M. I., Franke, K. W., & Westfall, B. B., 640.
Smith, W., 226.
—, & Stuart-Harris, C. H., 472.
Smithburn, K. C., 364.
Snider, G. E. See Massey, A. B., jt. author, 104.
Snow, J. E. See Beard, P. J., jt. author, 162.
Snyder, L. H., 49.
Sobra, K., 21, 330.
Sochor, N. I. See Friedman, A. P., et al., jt. authors, 115.
Soeparman, R. See Bakker, S., jt. author, 10.
Sokhey, S. S., & Maurice, H., 616.
Sokola, D., 175.
Sokoloff, I. I. See Yakimoff, W. L., et al., jt. authors, 327.
Solarino, G., 332.
—, & Alibrandi, A., 332.
Solonska, L. See Simitch, T. V., et al., jt. authors, 188.
Soltys, M., 124.
Soulie, 48.
Soulié, P., Borde, & Chevret, 440.
—. See also Poursines, Y., et al., jt. authors, 66.
Soussko, S. F. See Gousseff, W. F., et al., jt. authors, 591.
—. See also Yakimoff, W. L., et al., jt. authors, 247.
Spéder, E., 163, 301.
Spindler, L. A., 353.
Spiridonow, N. See Herrmann, O., et al., jt. authors, 62.
Spitz, G. See Yacoel, J., jt. author, 647.
Sprehn, C. S., 353.
Srikantaiah, G. N., 426.
—. See also Nayar, P. U., jt. author, 595.
Srinivasan, M. K. See Sen, S. K., jt. author, 592.
Srnetz, A. See Vacek, T., jt. author, 38.
Stableforth, A. W., 184.
—, Scorgie, N. J., & Gould, G. N., 463.
Stacey, M. See Topley, W. W. C., et al., jt. authors, 616.
Stadtler, 354.
Stalhammar, H., 244.
Stamatin, L. See Stamatin, M., jt. author, 154.
Stamatin, M., & Stamatin, L., 154, *bis*.

Stamp, T. C., & Hendry, E. B., 616.
Stang, V., 40.
Stankiewicz, W., 400.
Stark, C. N., & Curtis, L. R., 447.
Stark, P., & Sherman, J. M., 257.
Staub, A. See Ramon, G., jt. author, 153, 154.
Staub, C., 325.
Stazzi, P., 224, *bis*.
Steabben, D. B. See Kliene-berger, E., jt. author, 583.
Steck, W., 354.
Steenberg, E. See Schmidt, S., et al., jt. authors, 228, 371.
Steenbock, H. See Haman, R. W., jt. author, 85.
Steenken, W., Jr., & Landau, A., 107.
Stefanski, W., & Obitz, K., 382.
—, Strankowski, M., & Nagórski, F., 232.
Steffens, M., 141.
Stein, C. D. See Gochenour, W. S., et al., jt. authors, 259.
Steinbach, M. M., Klein, S. J., & Deskowitz, M., 364.
Steiner, A. See López, C., et al., jt. authors, 277.
Steinmetzer, K. See Benesch, F., jt. author, 37.
Stenn, F., 640.
Stepanoff, J. G. See Yakimoff, W. L., et al., jt. authors, 247.
Stephens, E. D. See Covell, G., et al., jt. authors, 330.
Stephens, E. H., & Gill, D. A., 316.
Stern, R. O. See Mackenzie, R. D., et al., jt. authors, 426.
Stewart, C. A., 409.
Stewart, J., 134.
—. See also Blakemore, F., jt. author, 241.
Stewart, J. L., 45, 148, 273.
Stewart, W. L., & Ponsford, A. P., 398.
Stickdorn, H., 121.
Stiles, G. W., Jr., 16.
Stockard, C. R., 627.
Stockmann, H. See Haupt, H., jt. author, 578.
Stockmayer, W., 267.
—. See also Zeller, H., jt. author, 61.
Stodola, F. H. See Anderson, R. J., et al., jt. authors, 56.
—. See also Growder, J. A., et al., jt. authors, 56.
Stoll, N. R., 284.
Stolnikov, V. I., 109.
Stolz, H., 545.
Stone, W. S., 515.
Stout, E. N. See Newsom, I. E., et al., jt. authors, 641.
Stover, D. E., 615.
Strankowski, M. See Stefanski, W., et al., jt. authors, 232.
Strong, P. S., 478.
Strong, R. P., Sandground, J. H., Bequaert, J. C., & Ochoa, M. M., 231.
Stuart, C. A., Fulton, MacD., Ash, R. P., & Gregory, K. K., 236.
Stuart, H. O. See Delaplane, J. P., et al., jt. authors, 7.
Stuart-Harris, C. H., 378.
—. See also Smith, W., jt. author, 472.
Stubbs, E. L., 294.
Stuchberry, H. M., 315, 339.
Sudzilovskij, M. N., & Scerbinin, I. V., 376.
Sugai, T. See Takeda, Y., jt. author, 339.
Sugimoto, M., 607, *bis*.
Sumulong, M. D., 98.
Sundram, P. S., 163.
Sveinson, S. See Host, P., jt. author, 189.
Svensson, S., 303.
—. See also Plaizkovski, U., jt. author, 552.
Sverák, A., 367.
Svinkina, A. A. See Epstein, G. W., et al., jt. authors, 157.
Swales, W. E., 281, 542.
Swift, H. F., 646.
—. See also Moen, J. K., jt. author, 390.
Symanzik, H., 489.
Symes, C. B., & McMahon, J. P., 607.
Symonds, S. L., 388.
Szász, A., 108, 208.
Szathmáry, J. See Schneider, L., jt. author, 619.

T

Tabbert, B. See Neumann-Kleinpaul, K., jt. author, 623.
Tachon, L. See Verge, J., et al., jt. authors, 545.
Takeda, Y., & Sugai, T., 339.
Talbot, R. J. de C. See Albiston, H. E., jt. author, 366.
Talbot, S. B., 231.
—. See also Cort, W. W., jt. author, 231.
Tang, F. F., 155.
Tanner, F. W., & Oglesby, E. W., 582.
Tanon, L., & Cambessédès, H., 529.
Tao, C. S., 538.
Tapley, J. B., 306.
Tarassov, V. A., 385.
Tassinari, G., 427.
Taylor, E. L., 473, *bis*.
Taylor, R. M., & Jorgensen, J. J., 265.
Tecce, R., 185.
Teichmann, 28.
Teixeira de Freitas, J. F., & Lins de Almeida, J., 474.
Tenhaeff, C., 258, *bis*.
—, & Ferwerda, S., 385.
Ten Hoopen, W., 258.
Ten Thije, J. H., 434.
Tetley, J. A., 474.
Theiler, M., 602.
Thibault, P., 371.
Thieulin, G., 488.
Thomas, R. C. See Breed, R. S., et al., jt. authors, 490.
Thompson, C. M. See Fitch, C. P., jt. author, 211.
Thompson, G. B., 230.
Thompson, J., 473.
Thompson, J. E., 385.
Thompson, W. T. See Davidson, W. T., et al., jt. authors, 465.
Thomson, A., 263, 264, 266, *bis*.
—, & Rislakki, V., 9.
Thomson, R. C. M. See Hadow, A. J., jt. author, 537.
Thornton, E. N., 10.
Thorp, F. See Newsom, I. E., et al., jt. authors, 641.
Thorp, F., Jr., & Graham, R., 118.
Tiedeman, W. von D. See Brooks, P. B., jt. author, 632.
Tiedge, L., 507.
Tischenko, F. K., 30.
Todd, C. See Perdrau, J. R., jt. author, 533.
Todorsky, F. A. See Yakimoff, W. L., jt. author, 466, *bis*.
du Toit, P. J., 10, 13, 69, 259, 304, 352, 554, 643.
Tokayer, J., 284.
Toma, A. See Balteanu, I., et al., jt. authors, 155.
Tomasec, I. See Hupbauer, A., jt. author, 71.
Tompkins, E. H., 364.
Topacio, T., 57, 59, 170.
Topley, W. W. C., Raistrick, H., Wilson, J., Stacey, M., Challinor, S. W., & Clark, R. O. J., 616.
Torikata, R., & Okumura, Y., 105.
Torrance, H. L., 512.
Torres, S., 427, 602.
—, & De Queirox Lima E., 601, *bis*, 602.
Toupaïtch, M., 114.
Toussieng, M. E., 527.
Tower, B. A. See Upp, C. W., jt. author, 348.
Toyoshina, T., & Shibuya, Y., 574.
Tracy, R. L. See Hoyt, A., et al., jt. authors, 471.
Traum, J., 114.
Trautwein, K., 264, 457.
Travassos, J., 331.
Trawinski, A., 125, 539.
Tréfouël, J. See Fourneau, E., et al., jt. authors, 299.
Tripkovic, 179.
Troitskij, A. V., 72.
Trojanovskij, D. See Kudjavcev, A., et al., jt. authors, 240.
Trombini, G., 224.
Trouche, 642.
Tscheredkoff, W. N. See Poltyreff, S. S., et al., jt. authors, 644, *bis*.
Tscherniak, W. Z., Marayew, P. W., & Goussew, A. A., 323.
Tschernjak, I. See Isabolinski, M., et al., jt. authors, 117.
Tschumakow, M. P., 78.
Tuenter, J. P. A. See Majoewsky, W. H. F. C., jt. author, 84.
Tulcinskaja-Tkacenko, 8.
Tully, W. C. See Franke, K. W., et al., jt. authors, 137, 250.
Tumanskij, V. M., & Kolesnikova, Z. I., 577.
Tunnicliff, E. A., & Marsh, H., 109.
Turbet, C. R., 256.
Turner, A. W. See Campbell, A. D., jt. author, 111.
Turner, C. W. See Garrison, E. R., jt. author, 85.
Turner, E. L., Dennis, E. W., & Kassis, I., 283.
Turner, H. N., 306.
Turney, G. J. See Bryan, C. S., jt. author, 2.
Tweed, W., 126.
Twomey, A. C., & Twomey, S. J., 250.
Twomey, S. J. See Twomey, A. C., jt. author, 250.
Twort, F. W., 172.
Tyzzer, E. E., 419, 523.
Tzanck, A., & André, R., 25.
Tzortzakis, N., & Papadakis, G., 536.
—. See also Mélanidi, C., jt. author, 534.

U

Udall, D. H., 311.
Udinzeff, J. G., 327.
Uhl, E., Englebreth-Holm, J., & Meyer, A R., 333.
Uhlenhuth, P., & Zimmermann, E., 68.
Ukil, A. C., & Gutha Thakurta, S. R., 261.
Ulber, W., 320.
Umezeu, M., 574.
Underwood, E. J., & Shier, F. L., 269.
Upp, C. W., & Tower, B. A., 348.
Urbain, A., 283.
—, Cahen, R., Pasquier, M. A., & Nouvel, J., 139.
Urbain, G., 395.
—. See also Hauduroy, P., et al., jt. authors, 561.
Urech, E., 219.

V

Valade, P., & Quarante, A., 240.
Valcarenghi, E., 184.
Vallée, M. See Rinjard, P., jt. author, 572.
Valli, M., 572.
Valtis, J., & van Deinse, F., 104, 571.
—. See also Nègre, L., et al., jt. authors, 260.
von Vásarhelyi, J., 25.
Vasil, Z., 344.
Vassilkova, Z., 609.
Vawter, L. R., 574.
Veazie, L., & Meyer, K. F., 110.
del Vecchio, G., 368, 369.
Velde, G., 602.
Velu, H., 47, *bis*.
—, & Zottner, G., 108, 153, 212.
—, —, Miegeville, H., & Grimpret, G., 636.
—, —, & Sarthou, C., 212.
—. See also Eyraud, E., et al., jt. authors, 163.
Venkataraman, R., 133.
Verge, J., 69.
—, Tachon, L., & Drieux, H., 545.
—. See also Leclainche, X., jt. author, 528.
Vergeer, T., 385.
Vertinskij, K., Bol, C., & Bransburg, A., 424.
Vianello, G., 224.
Vicars-Harris, N. H., 334.
Vidal, C. B., 364.
Videsott, R., 130.
Vink, H. H., 347.
DeVink, L. P. H. J., 569.
Vitzthum, H., 306.
Vladutiu, O. See Apostoleanu, E., jt. author, 623.
Voet, J. See Levaditi, C., et al., jt. authors, 380.
Vogel, H., 610.
de Vogel, W., 617.
Vogt, V., 18.
Volhard, F., 630.
van Volkenberg, H. L., 230, 428.
Volkert, K., 52.
Vontobel, H., 481.
Voot, J. See Levaditi, C., et al., jt. authors, 470.
Voss, H. J., 659.
de Vries, A. H., 229.
Vuillaume, P. See Goret, P., et al., jt. authors, 391.

W

De Waele, A., & Dedeken, L., 539.
Wagener, K., 40, 264.
Wager, V. A., 610.
Wagner, H., 481.
Wagner-Jauregg, T., 450.
Walbum, L. E., & Reymann, G. C., 322.
Walch-Sordrager, B. See Schüffner, W. A. P., jt. author, 593.
Waldmann, 278.
Waldmann, O., 40, 469.
—, Köbe, K., & Pyl, G., 596.
Wali, E. M., 297.
Walker, A. E., 430.
Walker, T., 608.
Walkiewicz, W., 178.
Wall, S., 83, 235, 239, 477.
Wallgren, I., 139.
Walsh, T. E. See Cannon, P. R., jt. author, 584.
Wang Kan. See Kien-Hun, B., jt. author, 11.
Ward, J. C. See McCrory, B. R., jt. author, 136.
Wardle, R. N., 372, *bis*.
Warrack, G. H. See Dalling, T., jt. author, 190.
Warren, D. M. See Butler, W. J., et al., jt. authors, 108.
Watarai, J., 282.
Waters, D. F. See Mason, E., jt. author, 143.
Watson, E. M., 33.
Watson, R., 634.
Weber, 411.
Wedum, A. G., 214, 514.
Wegner, E. E., 483.
Wehr, E. E., 539, 612.
Weichsel, M., & Salfeld, H., 619.
—. See also Salfeld, H., jt. author, 619.
Weiland, P., 572.
—. See also Selter, H., jt. author, 25.
Weinberg, M., 521.
—, Forgeot, P., & Moureu, A., 581.
—, & Guelin, A., 287.
—, & Guillaumie, M., 27, *bis*, 160, 581.
—, & Schneiter, P., 448.
Weinzirl, J. See Wong, S., jt. author, 104.
Weirether, F. J. See Plastridge, W. N., et al., jt. authors, 311.
Weisgerber, 513.
Weissfeiler, J., 233.
—, & Morosowa, F. N., 316.
Welborn, M. B. See LeBlanc, T. J., jt. author, 354.
Welch, H. See Foote, F. M., et al., jt. authors, 313.
Wells, R. W. See Knipling, E. F., jt. author, 536.
Wells, W. F., & Brown, H. W., 226.
Werdelin, C. See Jensen, B. H., et al., jt. authors, 431.
West, D. E. See Foote, F. M., et al., jt. authors, 313.
Westerheim, O., 24.
Westfall, B. B. See Smith, M. I., et al., jt. authors, 640.
Weyel, W., 396.
Wherry, F. P. See Feldman, W. H., et al., jt. authors, 340.
Whitby, T. L., Bosworth, T. J., & Innes, J. R. M., 369.
White, H. F. See Andrews, J., jt. author, 163.
White, P., & Caughley, F. G., 303.
White, P. See also Mattick, A. T. R., jt. author, 362.
White, P. B., 584.
Whitehead, W. E. See Maw, W. A., et al., jt. authors, 123.
Whitworth, S. H., 651, *bis*.
Wight, A. E., 459, 511.
Wiidik, 546.
Wilcke, H. L., 133, 553.
Wild, T., 347.
Wille, R., 39, 263.
Williams, C. B., & Milne, P. S., 182.
Williams, H. B., 94, 499.
Williams, J. W., 374.
Williams, W. L., 565.
Williamson, G., 643.
Wilson, D. E., & Evans, S. A., 460.
Wilson, G. S., Minett, F. C., & Carling, H. F., 643.
Wilson, J. See Topley, W. W. C., et al., jt. authors, 616.
Wilson, J. E. See Johnston, J. W., jt. author, 626.
Winther, O., 269.
Wirth, D., 291, 292, 468.
Witesbsky, E. See Neter, E., jt. author, 313.
Witte, J., 570.
Wittebolle, P., 585.
Witter, J. F., 444.
Wolf, A. A. See Nungester, W. J., et al., jt. authors, 64.
Wolf, C. H. See Seelemann, M., et al., jt. authors, 354, 549.
Wolff, E. K., & Austin, L. D. C., 254.
Wolff, J. W. See Kouwenaar, W., jt. author, 467.
Wolffhügel, K., 281, 538.
Wollenweber, N., Wüstenberg, J., & König, F., 628.
Wollman, E., & Bardach, M., 101.
—. See also Basset, J., et al., jt. authors, 583.
Wong, S., & Weinzirl, J., 104.
Wood, F. D. See Kofoid, C. A., et al., jt. authors, 635.
Wood, F. W. See Boynton, W. H., et al., jt. authors, 636.
Wood, J. L. M. See Camps, F. E., jt. author, 634.
Woods, D. D., 583.
Woods, G. M. See Boyton, W. H., et al., jt. authors, 16, 636.
Woods, O. R. See Gustus, E. L., et al., jt. authors, 88.
Wramby, G., 576.
Wright, E. J., 295.
Wright, J. G., 355, *bis*, 551.
Wright, M. C., 200.
Wu, K. See Kau, L. S., jt. author, 281.
Wüstenberg, J. See Wollenweber, N., et al., jt. authors, 628.
Wurst, R. See Benesch, F., jt. author, 464.
Wyckoff, R. W. G. See Biscoe, J., et al., jt. authors, 198.
Wylie, A. M., 189.
Wyssmann, E., 348.
Wyssotzky. See Poltreff, S. S., et al., jt. authors, 644.

Y

Yacoel, J., & Spitz, G., 647.
Yakimoff, W. L., 14, 418.
—, Baskakoff, W. P., Gousseff, W. F., Matschulsky, S. N.,

Mizkewitsch, W. J., Rastegaïeff, E. F., & Keschner, 15.
—, & Gousseff, W. F., 15, 417.
—, —, & Stepanoff, J. G., 247.
—, & Mizkewitsch, W. J., 67.
—, Nezwetaieff, N. W., & Yakowleff, 247.
—, Rastegaieff, E. F., & Soussko, S. F., 247.
—, Sokoloff, I. I., & Matschoulsky, S. N., 327.
—, & Todorsky, F. A., 466, *bis*.
Yakowleff. See Yakimoff, W. L., et al., jt. authors, 247.
Yanagisawa, K., 364.
Yapp, W. W., 9.
Yen, A. C. H., 425.
Young, T. D., 447.
Ypma, P. C., 300.

Z

Zarickij, L. A., 111.
Zarjadova, E. A. See Friedman, A. P., et al., jt. authors, 115.
Zasuchin, D. N., 590.
Zavrnik, F. I., 394.
Zeller, H., 264, 457.
—, & Stockmayer, W., 61.
Zerbel, E. See Ernesti, S., jt. author, 267.
Zernoff, V., 617.
Zeyland, J., & Piasecka-Zeyland, E., 569.
Ziegler, M., 491.
Zimmermann, E. See Uhlenhuth, P., jt. author, 68.
Zinn, E. See Lerche, M., et al., jt. authors, 549.
Znamensky, A. A., & Zobrina, B. C., 88.
Zobrina, B. C. See Znamensky, A. A., jt. author, 88.
Zofijevski, V., 50.
Zolog, M., & Comsia, O., 246.
Zolotareff, N. A., 466.
Zottner, G. See Eyraud, E., et al., jt. authors, 163.
—. See also Velu, H., et al., jt. authors, 108, 154, 212, 636.
Zucker, Z., 339.
Zuckerman, S., & Groome, J. R., 546.
Zuelzer, M., 69.
Zumpt, F., 310.
Zunker, 535.
Zuravlev, M. S., 229.
Zuwerkalow, D. A., & Sarkissoff, A. K., 126.

SUBJECT INDEX

The index is constructed from the titles of articles, which do not always indicate all the points of interest in the abstract or original. Readers should therefore always search the main headings and the "general" subheadings for points of special interest:—*e.g.* for references to the diagnosis of bovine brucellosis, see "Brucella infection, general" and "Brucella infection, in cattle" in addition to "Brucella infection, diagnosis". General headings should also be searched for particular parasites; for drug treatment see under names of conditions treated. Readers interested in animal disease in various countries should look under "Reports" as well as under the name of the country.

A

ABATTOIRS. See Food inspection, meat inspection; Reports, Norway; Slaughter.

ABORTION. Enzootic, in ewes, **516**; a new salmonella as the cause of abortion in cattle, **58**; non-bacterial, in mares, **345**; differential diagnosis of equine, **318**.
See also Brucella infection, in cattle, in swine; *Salmonella abortus-equi* infection [equine abortion]; Trichomonad infection, bovine.

ACANTHOCEPHALA. See *Echinopardalis*.

ACAPRIN. See Babesia infection, treatment.

ACETONAEMIA. Acetonaemia of cattle, **241**.

ACID-FAST BACTERIA. See *Mycobacterium*, general.

ACIDOSIS. Of pregnant ewes, **295**.
See also Pregnancy disease of sheep.

ACTINOMYCES. *A. bovis* Harz a *nomen dubium*, **323**; history, synonyms and cultural characters of *A. sulphureus*, **323**; meningitis in a dog caused by an Actinomyces, **323**.

ACTINOMYCETES. Study of acid-fast actinomycetes from soil. Pathogenicity for animals, **270**.

ACTINOMYCOSIS. Role of staphylococci in the production of, **101**; allergy to tuberculin in actinomycosis, **475**.

ADDER. See Venoms.

ADRENAL GLAND. Adrenals in the response of the organism to injuries and intoxications, **399**; abnormal pigmentation of the kidneys and adrenal glands of cattle, **347**; mineral metabolism and the suprarenal gland, **251**.

AEROBES. See Bacteria general.

AFRICA. See under names of specific diseases and under names of territories.

AFRICAN HORSE-SICKNESS. See Horse-sickness, African.

AGALACTIA. Treatment with prolan of agalactia in mares and sows, **37**.

AGE. Age resistance in relation to Helminth infestation, **231**.
See also Eimeria infection, avian; Rickets.

AGGLUTINATION.
General. Relation of the complement-fixation optimum to the agglutination optimum, **286**; spot method of conducting whole-blood tests with stained antigen, **615**.
See also under name of specific disease.
Agglutinins. Occurrence of *Fusiformis necrophorus* agglutinins in animals, **340**; iso-electric zones of *Eberthella typhosa* and *Brucella abortus* agglutinins, **26**.

AGGLUTINOGENS. Nature of, **187**.

ALARIA. *A. canis* a trematode parasite in dogs, **385**.

ALGERIA. See Reports, Algeria; Rickettsia infection; Ringworm; Theileria infection.

ALIMENTARY TRACT. See Digestive system; Intestines.

ALKALI DISEASE. See Poisoning, selenium.

ALLERGY. **475**; heteroallergy in tuberculosis, tissue reaction of tuberculous animals to pathogenic microorganisms, **233**; bacterial allergy and experimental infection of the lungs with streptococci and *Brucella abortus*, **127**; reaction in "Broken Wind" for haymoulds, **476**; increase in the g. pig by inoculations of killed cultures of *Mycobacterium paratuberculosis* the glanders bacillus, *Pasteurella pseudotuberculosis* and Brucella embedded in vaseline **475**.
See also Anaphylaxis; Intradermal tests; Sensitization; Shwartzman's phenomenon, and under name of specific disease.

ALUMINIUM HYDROXIDE. See Clostridium infection, immunization; Foot and mouth disease; Fowl plague.

AMIDOSTOMUM. *A. anseris* of geese in Washington, **430**.

AMOEBA. See *Entamoeba*.

AMPHISTOMUM. In sheep and goats from Allahabad, **183**.

AMYLOIDOSIS. Of kidneys of cattle, **129**.

ANAEMIA. Of cattle in France, **134**.
See also Anaemia, equine infectious.
Parasitic. See *Ancylostoma*.
In Swine. Nutritional, in piglets, **350**.
Treatment. With copper, **442**.

ANAEMIA, EQUINE INFECTIOUS.
General. **72**, **73**, **597**; in Prussia, **72**; in Yugoslavia, **424**; in France, **597**; in New York State, **598**; pathology of, **175**, **597**; research, **72**, **221**; Diptera as carriers, **598**.
Diagnosis. Blood picture, **330**; daily temperature curve, **222**; mercuric chloride test, **72**.
Virus. Action of phenol on virulence of spleen, **72**; action of glycerin on virulence of spleen, **276**.

ANAEROBES. See Antigens; Bacteria general, technique [cultivation]; *Clostridium*; Technique.

ANAPHYLAXIS. Anaphylaxis and sensitization, **79**; anaphylaxis, tuberculosis and the sympathetic nervous system, **233**; effect of drugs on sensitiveness to anaphylaxis and tuberculosis, **431**.
See also Allergy; Sensitization.

ANAPLASMA INFECTION. Attempt to transmit by biting flies, **170**.
Bovine. In the U.S.A., **327**; studies of the blood of cattle in health and during anaplasmosis, **327**; dog tick *Dermacentor occidentalis*, a vector in California, **170**.
Immunization. **170**.
Ovine. In France, **16**; effect of splenectomy, **16**.
Transmission. By ticks and by unclean instruments, **16**.
Treatment, **637**.

ANATOMY. See Books, text books; Digestive system, general; Physiology; and specific organs.

ANATOXINS. See Bacteria general, toxins; *Clostridium tetani* infection, immunization; *Staphylococcus*.

ANCYLOSTOMA. Acquired immunity to *A. caninum*, **611**; probable relationship between anaemia and susceptibility to hookworm infection, **611**.

ANGIOSTRONGYLUS. *A. vasorum* causing cardiac and pulmonary strongylosis of the dog, **540**.

ANIMAL HUSBANDRY. See Zootechny.

ANIMAL CENSUS. See Livestock populations.

ANOPLOCEPHALIDAE. See *Moniezia*.

ANTELOPES. See Trypanosoma infection, in wild animals and birds.

ANTHELMINTICS. Comparison of the efficiency of, **36**; Carbon-Tetrachloride and Tetra-Chlorethylene, **247**; experience with carbon tetrachloride drenches, **353**; treatment of lambs, **195**; treatment for canine whipworms, **247**; lethal effect of chemicals on the eggs of nematodes and the oocysts of coccidia, **441**; mass feeding of sheep with copper sulphate and salt to control gastro-intestinal parasites, **551**.
See also under name of helminth.

ANTHRAX. See *Bacillus anthracis* infection.

ANTIBODIES. Antigens, antibodies and immunity, **617**; with multiple affinities, **236**; relations between certain heterophile antibodies and antigens, **236**; brain antibodies in men, **619**; permeability of the lungs to antibodies, **236**; humoral antibodies in poliomyelitis, **391**; studies with purified serum proteins bearing on the unitarian theory of antibodies, **432**.
See also Agglutination; Antigens; Antisera; Antitoxins; Immunity; *Mycobacterium tuberculosis* infection, immunity, immunization [BCG].
ANTIGENS. Antigens, antibodies and immunity, **617**; immunizing antigens of bacteria, **616**; theory and practice of assaying, **432**; relation between certain heterophile antibodies and antigens, **236**; glycolipid antigens, **615**; experiments with synthetic antigens, **617**; immunological properties of artificial antigen containing glucuronic acid, **188**; effect of preservatives on undenatured bacterial antigens, **79**; "O" antigen of certain bacteria and the principal constituent of their endotoxin, **187**; bacterial variations and complete somatic O antigen, **288**; brucella antigens, **519**; antigenic structure of brucella group, **414**; Vi antigen of *Bacillus typhosus*, **288**; antigen therapy, **188**.
See also Antibodies, and under name of disease.
In fatty bases. Lanolin vaccines in the treatment and prophylaxis of mastitis, **312**; immunity conferred by the inoculation of *Mycobacterium tuberculosis* in antigens in oily excipients, **155**; inoculation of g. pigs with living tubercle bacilli in lanoline or tapioca, **234**; increase of allergy in the g. pig by inoculations of killed cultures of *Mycobacterium paratuberculosis* the glanders bacillus, *Pasteurella pseudotuberculosis* and *Brucella*, embedded in vaseline, **475**; the production of specific antisera to anaerobes by injections of antigen in a lanolin base, **27**; effect on g. pigs of injection of foot and mouth disease virus in an oil emulsion, **329**.
See also *Brucella abortus* infection, immunization; *Erysipelothrix rhusiopathiae*; *Clostridium tetani* infection, toxin; *Staphylococcus*.
ANTIMONY. Results and progress in antimony therapy, **505**.
See also *Dicrocoelium*; Leishmania infection.
ANTISEPTICS. Effect of chemical constitution of soaps upon their germicidal properties, **248**; bactericidal and biological properties of phenyl mercuric subnitrate, **248**; antiseptic and bactericidal power of diacetyl on bacteria, **248**; antiseptic action of derivatives of 8-hydroxyquinoline and of 6-methyl-8-hydroxyquinoline on bacteria, **248**.
See also Disinfectants.
ANTISERA. Production of specific antisera to anaerobes by injections of antigens in a lanolin base, **27**; antiserum treatment of bovine contagious pleuro-pneumonia, **172**.
See also Immunity and under names of specific diseases.
ANTITOXINS. Official United States and international unit for standardizing gas gangrene antitoxin, **27**.
See also Antibodies; Clostridium infection; Immunity.
ANTIVIRUS. Electro-antivirus, **392**.
AORTA. See Circulatory system.
APOPHALLUS. Heterophid trematode *Apophallus* in domestic animals in Canada, **283**.
APPARATUS. For the cultivation of anaerobic bacteria, **448**; precision photometer for study of suspensions of bacteria, **143**; new bottles for blood culture work, **494**; electrocardiograph and its clinical application in the horse, **648**; mechanical insect traps, **182**.
See also Centrifugation; Filtration.
ARGAS. See Ticks.
ARGENTINE. See Psittacosis.
ARMY. See Reports; Services, veterinary.
ARSENIC. Arsenic-fastness of Trypanosomes, **442**.
See also Poisoning, general.
ARSENOBENZOL. See Trypanosoma infection, treatment.
ARTERIES. See Circulatory system.
ARTHRITIS. Arthritis deformans of foals, **347**.
ARTHROPODS. In the feathers of birds, **381**.
See also Blowflies and fleshflies; Entomology; Glossina; Invertebrate vectors of disease; Lice; Linguatula; Mange; Mosquitoes; Parasitic infestation, general; Repellents.
ARTIFICIAL INSEMINATION. See Insemination, artificial.
ASCARIDS. Chemotherapy of ascariasis, **36**; in fowls, **195**, **353**.
ASCARIS. Factors influencing the development of *A. suum*, **337**; effect of ultracentrifuging on oxygen consumption of the eggs of *A. suum*, **337**; technique for the isolation of eggs from soil, **494**; destruction of eggs in stables and kennels, **612**.
ASCAROIDEA. Fauna of British India, Ascaroidea, **183**.
ASCORBIC ACID. See Vitamins, vitamin C.
ASSOCIATIONS. American Public Health Association Yearbook. 1935-1936, **451**.
See also Committees; Conferences; Congresses; Conventions; Reports.
ATAXIA. See Poisoning, plant poisoning.
ATMOSPHERIC PRESSURE. See Pressure, atmospheric.
AUJESZKY'S DISEASE, 116; death in the night, **529**; blood urea of cattle, **529**; histological changes in central nervous system, **424**; avirulent regions in the nervous system, **529**; vaccination, **529**; biological properties of virus, **75**; experiments with virus, **599**.
AUSTRALIA. A veterinarian's notes on north-west corner of New South Wales, **357**.
See also Arthropod parasites; Helminth parasites, sheep parasites; Milk, hygiene; *Mycobacterium paratuberculosis* infection [Johne's Disease]; Parasitic infestation, general; Poisoning, plant poisoning; Psittacosis; Reports, Australia; *Taenia*.
AUSTRIA. See Fowl Paralysis; Psittacosis; Reports, Austria; Trichomonas infection, bovine.
AVITAMINOSIS. In sheep with reference to lesions in the central nervous system, **192**; avitaminosis and infection in ducks, **549**; polyavitaminosis and asulphurosis, **295**.
See also Nutritional Diseases; Scurvy (Vitamin C deficiency) Vitamins.
AZOTURIA. See Myoglobinuria paralytica, equine.

B

BABESIA INFECTION [PIROPLASMOSIS].
General. Nomenclature of Piroplasms, **12**; relationship between *B. bigeminum* and *Francaiella colchica* in Russia, **418**; development of *B. bigemina* in *Boophilus microplus*, **418**; vectors of bovine and equine infections in Czecho-slovakia, **376**.
Bovine. Congenital infection in calves, **466**; in Northern Australia, **67**; in Italy, **376**; in the U.S.A., **418**; in the U.S.S.R., **67**, **466**; vectors of bovine babesiasis and francaiellasis, **591**.
Canine. Life-History and morphology of *B. canis* in *Rhipicephalus sanguineus*, **166**, **428**.
Caprine. *Piroplasma taylori* of the goat, **170**.
Control, 15; use of mountain pastures as a prophylactic measure against infection in cattle in the valley of Hissar, U.S.S.R., **467**.
Equine, 466; Nuttalia infection of Mules, **376**; in the Côte d'Or, France, **465**; in the U.S.S.R., **466**, **590**; congenital infection in foals, **68**, **466**.
Immunization, 170.
Ovine. Placental transmission of *B. ovis* and *Anaplasma ovis*, **376**.
Treatment, 440; in dogs, **636**; in horses, **247**; in Morocco, **636**; of bovine infection in the U.S.S.R. with chemical products, **247**.
BACILLAEMIA. See *Mycobacterium tuberculosis* infection, bacillaemia.
BACILLARY WHITE DIARRHOEA. See *Salmonella pullorum* infection.
BACILLUS ABORTUS. See *Brucella abortus*.
BACILLUS ANTHRACIS. Morphology of, **103**; biology and pathogenicity, **49**; viability, **153**; dissociation, **154**; physico-chemical characters of anthrax precipitin serum, **391**; cultural conditions influencing capsule formation, **568**; specific capsule substance of anthrax bacilli in aerobic, spore-bearing saprophytic bacilli, **568**; reaction with iron compounds for the determination of *B. anthracis* and of its pathogenicity, **568**; variation, **568**.
B. ANTHRACIS INFECTION.
General, 2; in man, **509**; in swine, **509**; in rabbits, **49**; in Holland, **258**; in Germany, **257**; first outbreak in the Philippine Islands, **257**; in buffaloes in Bulgaria, **101**; diagnosis from carcass material, **49**; causes of sudden death, **258**.
Immunization. In Yugoslavia, **102**; glucoside vaccine, **50**, **455**; intradermal vaccination and antibody formation, **101**; vaccine in lanolin or a mixture of gelatin and alum, **153**; vaccine in agar and alum, **154**; immunizing power of uncapsulated colonies of *B. anthracis*, **154**; trials with various vaccines, **259**; immunity after single vaccination, **567**.
B. BOTULINUS. See *Clostridium botulinum*.
B. CHAUVOEI. See *Clostridium chauvoei*.
B. COLI. See *Bacterium coli*.
B. GALLINARUM. See *Salmonella gallinarum*.
B. MALLEI. See *Pfeifferella mallei*.
B. MELITENSIS. See *Brucella melitensis*.
B. NEPHRIDITIS EQUI. See *Bacterium equirulis*.
B. OEDEMATIENS. See *Clostridium oedematiens*.
B. PALUDIS. See *Clostridium welchii*.
B. PERFRINGENS. See *Clostridium welchii*.
B. PSEUDOTUBERCULOSIS. See *Corynebacterium pseudotuberculosis*.
B. PULLORUM. See *Salmonella pullorum*.
B. PYOGENES. See *Corynebacterium pyogenes*.
B. SANGUINARIUM. See *Salmonella gallinarum*.
B. SUIPESTIFER. See *Salmonella choleræ-suis*.
B. OF SWINE ERYSIPELAS. See *Erysipelothrix rhusiopathiae*.

B. TETANI. See *Clostridium tetani*.
B. TUBERCULOSIS. See *Mycobacterium tuberculosis*.
B. TYPHOSUS. See Salmonella infection, immunization.
B. WELCHII. See *Clostridium welchii*.
BACTERIA GENERAL.
General. Bacillus as a bacterial generic name, **64** ; dictionary of pathogenic bacteria, **561** ; biology of anaerobic bacteria and pathology of anaerobic diseases, **520** ; influence of infection on tissue respiration, **64** ; effect of mucin on infections, **64** ; important factor in mechanism of specific bacterial agglutination, **184** ; aerobic bacteria in the bile of healthy cattle in Java, **584** ; infection following tick infestation in lambs, **622**.
See also Antivirus ; Centrifugation ; Disinfectants ; Intestines, flora ; Milk, bacterial content ; Therapeutics.
Cultivation. See Bacteria general, technique [cultivation].
Electrical Charge. Iso-electric zones of *Eberthella typhosa* and *Brucella abortus* agglutinins, **26**.
Growth. Bacterial nutrition, **214**.
Immunity. See Agglutinogens ; Antigens ; Immunity, bacterial ; inflammation ; and under names of specific bacteria.
Nomenclature. Status of the generic term *Bacterium* Ehrenberg 1828, **12** ; bacterial taxonomy, **584**.
Technique [General]. Microscopical method of distinguishing dead from living cells, **253** ; simple method of staining bacterial cilia, **253** ; filter candles for preparing bacteria-free filtrates, **449** ; preservation of bacteria by drying *in vacuo*, **448** ; method for preserving bacterial cultures by freezing and drying, **646**.
See also Apparatus.
Technique [Counts]. Precision photometer for the study of suspensions of bacteria and other microorganisms, **143**.
See also Milk, bacterial content.
Technique [Cultivation]. Apparatus for the culture of anaerobic bacteria, **448** ; separation of anaerobes and aerobes by the Fortner glass plate method, **357** ; growth promoting and growth-inhibiting substances present in brilliant-green bile medium, **448**.
See also Media, culture.
Toxins. Relationship between toxins of staphylococci and those of the gas gangrene group, **392**.
See also *Clostridium*.
Viability. The fate of phagocytosed acid-fast bacteria as determined by the single cell method, **157** ; effects of ultra-high atmospheric pressure, **583** ; viability of bacteria introduced into the upper respiratory tract of normal and intranasally inoculated rabbits, **584** ; disinfectant action of superheated steam, **196**.
See also Antiseptics ; Disinfectants.
BACTERICIDES. See Antiseptics ; Bacteriophage ; Disinfectants.
BACTERINS. See Vaccines.
BACTERIOLOGY. See Bacteria general.
BACTERIOPHAGE. Determination of size by ultrafiltration, **380** ; deproteinization, concentration and observation of, **75** ; in animal faeces, **427** ; effects of ultra-high atmospheric pressure, **583**.
See also Centrifugation ; Lysozyme.
BACT. ABORTUS-EQUI. See *Salmonella abortus-equi*.
BACT. AERTRYCKE. See *Salmonella typhi-murium*.
BACT. ALCALESCENS. *Bact. alcalescens* septicaemia in calves, **577**.
BACT. COLI. Development of pathogenicity by *Bact. coli* by cultivation in filtrate from pathogenic bacteria, **322** ; antistaphylococcal immunity and *Bact. coli* infection, **480** ; differentiation of human and animal strains, **516** ; classification of *B. coli* from diseased calves, **515**.
See also Bacteriophage ; Food poisoning, meat poisoning.
BACT. ENTERITIDIS. See *Salmonella enteriditis*.
BACT. EQUIRULIS. As secondary invader in strangles, **507**.
BACTERIUM INFLUENZAE MURIUM. See *Haemophilus influenzae murium*.
"BACTERIUM INFLUENZAE PUTORIORUM MULTIFORME." See *Pasteurella*.
BACT. PULLORUM. See *Salmonella pullorum*.
BACT. SANGUINARIUM. See *Salmonella gallinarum*.
BACT. SUIPESTIFER. See *Salmonella cholerae-suis*.
BACT. TULARENSE INFECTION. In birds, **577**.
BANG, B. Selected works, **98**.
BANG'S DISEASE. See Brucella infection.
BARTONELLA. Morphology of *B. canis*, **467**.
BATS. See Rabies, general ; Trypanosoma infection, in wild animals and birds.
BCG VACCINATION. See Mycobacterium tuberculosis infection, immunization [BCG].
BELGIAN CONGO. See Brucella infection, in man [undulant fever] ; Schistosoma infection, general ; Vagina.
BELGIUM. See Law, Belgium ; *Mycobacterium tuberculosis* infection, tuberculin test.
BERYLLIUM. See Poisoning, inorganic.
BILE. Aerobic bacteria in the bile of healthy cattle in Java, **584**.
BILIARY FEVER. See Babesia infection.
BILIRUBINAEMIA. In equine encephalomyelitis, **115**.
BIOCHEMISTRY. Introduction to comparative biochemistry, **564**.
See also Blood, chemical composition ; Endocrine system ; Metabolism ; Vitamins.
BIOLOGICAL CONTROL. See Myxomatosis.
BIOLOGICAL PRODUCTS.
General. Report of the American Veterinary Medical Association Committee on Veterinary Biological Products, **454**.
See also Antisera ; Antitoxins ; Vaccines.
Preservation. Pauli's method, **584** ; method for preservation of sera by desiccation in the frozen state without use of refrigerants, **448** ; effect of preservatives on undenatured bacterial antigens, **79**.
Standardization. See *Clostridium oedematiens* ; *Mycobacterium tuberculosis*, tuberculin ; Sex hormones.
BIOLOGY. See Books, text books.
BIRDS. See Fowls ; Poultry.
BISON. See Brucella infection, general.
BLACK DISEASE OF SHEEP. See Clostridium infection, in sheep.
BLACKHEAD. See *Histomonas meleagridis* infection.
BLACKLEG ; BLACKQUARTER. See Clostridium infection.
BLADDER. See Haematuria ; Urinary system.
BLINDNESS. See Eyes, diseases ; Fowls, diseases general.
BLOEDPENS. See Clostridium infection, in sheep.
BLOOD.
General. Veterinary Haematological Review for 1934, **291**, and 1935, **292** ; new bottles for blood culture work, **494** ; method for obtaining bovine arterial blood, **494** ; manual of blood morphology, **564**.
Chemical Composition. Influence of solar ultraviolet irradiation in dairy calves, **252** ; partition of calcium and inorganic phosphorus in equine serum, **251** ; variations in inorganic P and Ca content of the blood of horses, **447** ; blood survey of cattle on the volcanic regions in Tanganyika, **646** ; blood urea in botulism in cattle, **161** ; in rabbits infected with *Tryp. annamense*, **218** ; of cattle in health and during anaplasmosis, **327** ; changes in equine encephalomyelitis, **115** ; serum protein changes induced by rinderpest virus, **114** ; protein changes in ox and goat serum induced by hyperimmunization against rinderpest virus, **275** ; variations in protein fractions of serum of swine during hyperimmunization against swine fever, **227** ; composition of swine-fever-virus blood after preservation, **276**.
See also Aujeszky's disease ; Blood coagulation ; Calcium metabolism ; Magnesium ; Phosphorus, metabolism.
Coagulation. Coagulation time of blood of goats, swine, sheep, dogs, and rabbits, **139** ; calcium factor, **251**.
Corpuscles [red]. Number in certain ungulates, **139** ; formation and destruction, **553** ; size of erythrocytes in healthy and sick dogs and horses, **627** ; mechanism of polycythaemia by carbon tetrachloride poisoning, **643**.
Corpuscles [white]. Presence of a factor which promotes amoebid movement of the neutrophilic granulocytes, **139** ; inclusion bodies in the leucocytes of fowls, **171** ; eosinophile leucocytes in milk, **244** ; method of estimating number of thrombocytes, **449**.
Counts. See Blood, picture.
Diseases. Sublimate tests in blood diseases, **394**.
See also Anaemia ; Haematuria ; Haemoglobinuria ; Leucosis ; Pupura.
Groups. In horses, **480** ; blood groups and mitogenic radiation, **543**.
Haemoglobin. Determination as globin picrate, **357** ; haemoglobin level of cattle on the volcanic regions of Tanganyika, **646** ; cellular elements and haemoglobin in the blood of chickens with spontaneous tuberculosis, **156**.
See also Blood, picture.
Picture. Neutrophilic blood picture of horses and cattle, **139** ; normal leucocyte blood picture of calves, **198** ; of sheep, **198**, **252** ; leucocyte formula of buffaloes, **446** ; normal leucocyte picture in a hot climate, **139** ; effect of splenectomy in laboratory animals, **213** ; in bovine TB, **3** ; haemotology of the rabbit in TB of the Yersin type, **55** ; interplay of the cells of the haemopoietic tissues in rabbits infected experimentally with the tubercle bacilli, **569** ; of glandered horses subjected to Panek's provocation test, **158** ; reticulocyte count during experimental *Tryp. equiperdum* infection of the rabbit, **163** ; in experimental swine fever, **71**.
See also Anaemia, equine infectious ; Blood, corpuscles ; Encephalomyelitis equine.

BLOOD [cont'd].
Serum. Albumin-globulin ratio in healthy and sick animals, **398** ; nature of a virucidal substance in "normal" human serum compared with the trypanocidal and bactericidal substances, **478** ; alteration in the bactericidal power in the presence of inflammation, **619** ; occurrence of carotinoids in animal sera, **548**.
See also Biological products.
BLOOD BRAIN BARRIER. Importance in infectious diseases of the central nervous system, **81**.
BLOOD VESSELS. See Circulatory system.
BLOWFLIES AND FLESHFLIES. Biology and physiology of *Lucilia sericata*, **121** ; significance of bracken, **122** ; sheep blowfly investigations, chemotropism of *L. sericata* and chemistry of the fleece, **280** ; types of sheep prone to attack, **383** ; scarcity in South Africa in 1934-1935, **229** ; in Australia, **429** ; species involved in sheep myiasis in South West Scotland, **537** ; new blowfly *Phormia terrae-novae* attacking sheep in Western Scotland, **537** ; cutaneous myiasis in Madras, **382** ; prevention of myiasis in wounds by the use of "Bone oil", **36** ; prevention of attack in sheep, **121** ; effect of trapping on the incidence of strike, **382** ; jetting and crutching for the control of strike, **383** ; laboratory breeding of *Wohlfahrtia vigil*, *Calliphora erythrocephala* and *Lucilia sericata*, **383** ; animal blowflies attacking man, **428**, **429**.
BLUETONGUE. In Uganda, **498**.
BODY TEMPERATURE. See Temperature, body.
BONE MARROW. Changes in liver fluke disease in sheep, **474**.
BONES.
General. On the healing of fractures, **31** ; anatomical changes and their relationship to rickets, **134**.
Composition. Function of the bone cell, **444** ; problem of calcification, **142** ; total ash of sheep's bones as an index to calcification, **303**.
Diseases. Generalized osteopetrosis due to fluorine poisoning, **301** ; kinky tail in cattle, **30** ; osteomalacia in cattle in Poland, **32** ; osteomyelitis in buffaloes, **11** ; osteitis deformans in fowls, **133**.
See also *Mycobacterium tuberculosis* infection, bone infection ; Nutritional diseases ; Perosis ; Ringbone ; Skeletal disease ; Spondylitis.
BONE OIL. Prevention of myiasis in wounds, **36**.
BOOPHILUS. See Ticks.
BOOKS.
Biochemistry. Introduction to comparative biochemistry, **564** ; vitamins and hormones, **152** ; vitamins in theory and practice, **564** ; follicular hormone, **506** ; pregnancy diagnosis in cattle, **660**.
Biology. Animal biology, **100** ; college zoology, **360** ; normal morphology of the thymus, **444** ; manual of blood morphology, **564** ; the camel, **151** ; physiology of the elephant, **251** ; classification, bionomics and control of tsetse flies, **310** ; introduction to nematology, **660** ; fauna of British India, including Ceylon and Burma. Nematoda, **183** ; principles of heredity, **47** ; elementary genetics, **408**.
Diseases general. Research on constitution and control in animal breeding, **48** ; geography of disease, preliminary survey of incidence and distribution of tropical and other diseases, **237** ; control of bovine tuberculosis in France, **402** ; tuberculosis in man and animals, **359** ; control of bovine tuberculosis in man, **562** ; clinical diagnosis of internal diseases of domestic animals, **151, 504** ; Malkmus' clinical diagnosis of the internal diseases of domestic animals, **360** ; pathological anatomy of domestic animals, liver and pancreas, **359** ; periodontal disease in the horse, **659** ; ticks and equine piroplasmosis in Russia, **590** ; diseases os rabbits, **309**.
Hygiene. Textbook of meat inspection, **99** ; hygiene in the bacon factory, **660**.
Parasitology. Internal parasites and parasitic diseases of sheep, treatment and control, **205** ; manual of medical and veterinary helminthology, **206** ; précis of parasitology, **310** ; onchocerciasis in Central America, **231**.
Reference books. International veterinary conventions, **304** ; Norway's veterinary college, **305** ; history of the development of the veterinary profession in Germany, **404** ; dictionary of pathogenic bacteria, **561** ; Bang's selected works, **98** ; catalogue of British medical films of interest to practitioners and students 1936-1937, **506** ; 11th yearbook of the Veterinary Medical Faculty University of Sofia 1934-1935, **143** ; American Public Health Association yearbook, 1935-1936, **451** ; Merck's yearbook of new work on pharmacology and therapeutics, **635**.
Therapeutics. Practical veterinary pharmacology, materia medica and therapeutics, **505** ; results and progress in antimony therapy, **505**.
Miscellaneous. Local immunity, **562** ; first steps for the veterinary practitioner, **506** ; practical animal husbandry, **152** ; laboratory practice, **660** ; practical exercises in zoological microtechnique, **408** ; manual of the silver fox and fur farming industries, **99**.
BORNA DISEASE. "Saprophytic" virus obtained from the dog, **178**.
See also Encephalomyelitis, equine.
BORRELOMYCES PERIPNEUMONIAE. See Pleuropneumonia, contagious bovine.
BOTHRIOCEPHALIDEA. See *Diphyllobothrium*.
BOTS. See Oestridae, bots.
BOTULISM. See *Clostridium botulinum* infection.
BRACHYLAEMUS. See *Harmostomum*.
BRACKEN. See Blowflies and fleshflies ; Poisoning, plant poisoning.
BRADSOT. See Clostridium infection, in sheep.
BRAIN. Comparison of the mesencephalon and hippocampus as sites of election for Negri bodies in rabies, **600**.
See also Actinomyces ; Antibodies ; Aujeszky's disease ; Brucella infection, in swine ; Circling disease ; Encephalitis ; Encephalomalacia ; Encephalomyelitis ; Meningitis ; Nervous system, diseases ; Oestridae, warbles.
BRAXY. See Clostridium infection, in sheep.
BRAZIL. See Babesia infection, canine ; Brucella infection, diagnosis ; Heartwater ; Icterohaemoglobinuria ; Swine fever, diagnosis.
BREEDING. Genetics in animal breeding, **87** ; influence of season and diet on mares, **481**.
See also Diseases general, unspecified ; Genetics ; Insemination, artificial ; Law, Germany ; Pregnancy ; Sterility.
BRITISH GUIANA. Report of a veterinary surgeon from Dutch Guiana on animal disease and cattle breeding in British Guiana, **308**.
See also Reports, British Guiana.
BRITISH ISLES. See Great Britain.
BRITISH SOMALILAND. See also Camels, diseases ; Reports, British Somaliland.
BROKEN WIND. See Respiratory system, diseases.
BRONCHITIS, INFECTIOUS. In horses, **222** ; cultivation of the virus of avian infectious bronchitis, **472**.
See also Laryngotracheitis.
BRONCHITIS, VERMINOUS. Of swine, **612**.
See also Lungworms.
BRONCHO-PNEUMONIA. In swine, **130**.
BRUCELLA ABORTUS. See Brucella group ; Brucella infection.
BRUCELLA GROUP.
General. Antigens, **414, 519** ; physical properties and agglutinability of *Br. abortus* plate antigens, **211** ; serological classification, **110** ; methylene blue reduction, **11** ; biological constancy of *Br. abortus*, **110** ; results of passage of human and monkey strains of *Br. melitensis* through pregnant heifers, **461**
Chemical composition. Carbohydrates, **159** ; electric charge and chemical composition, **10**.
See also Brucella infection, immunity.
Differentiation, 62 ; by alkali fastness, **321** ; with Petragnani's medium, **10** ; in egg media, **11, 321** ; by Huddleson's bacteriostatis and hydrogen sulphide methods, **62** ; study of forty strains isolated in Minnesota, **110** ; Kozlovski's method of staining *Br. abortus*, **401**.
Viability. In water, **462** ; in the aborted foetus and its membranes, **516**.
BRUCELLA INFECTION.
General. In animals and man, **10** ; in bison and elk in U.S.A., **109** ; in Tanganyika, **579** ; in Italy, **367, 368** ; animal reservoirs, **461** ; experimental infection, **61** ; investigation of blood and temperature in infected laboratory animals, **212** ; pathogenesis for laboratory animals, **370, 580** ; experimental simultaneous brucella infection and tuberculosis, **344** ; distribution of *Br.m.* var. *melitensis* in the U.S., **580**.
In calves. Connection between infection and spotted kidneys, **320**.
See also Brucella infection, in cattle.
In cattle, 238, 412 ; infection mechanism, **263** ; in the U.S.A., **9** ; in Denmark and Finland, **9** ; in East Java, **10** ; 1,000 cows testing suspicious (1:50) to the agglutination test and their subsequent test behaviour, **412** ; effect of *Br. abortus* in udderless cows, **211** ; connection between ovarian cysts and brucellosis, **578** ; in bulls, **459** ; transmission by coitus, **263** ; Wildbolz' reaction in infection in cattle, **235**.
See also Brucella infection, control, diagnosis, immunization, milk, transmission.
Control. In Europe, **264, 265** ; in Denmark, **413** ; in Estonia, **60** ; in France, **434** ; in Germany, **29, 434, 578** ; in Norway in 1935, **60** ; in Spain, **518** ; in Switzerland, **291, 320** ; in the U.S.A., **211, 459, 517** ; attempts to rear healthy cattle from calves on infected farms, **263**.
Diagnosis [allergic test], 78, 184 ; double intradermal test (Holtum's technique) as an additional aid, **614**.
See also *Mycobacterium tuberculosis* infection, tuberculin test.

BRUCELLA INFECTION [cont'd].
Diagnosis [cultural], 184 ; cultural diagnosis of bovine and porcine infection, **109** ; isolation of *Br.a.* from the blood-stream of cattle, **518** ; examination of faeces and urine of cows, **516**.
Diagnosis [serological], 267 ; allergic and agglutination reactions in animals premunized or vaccinated against brucellosis, **108** ; comparison of different methods, **184** ; factor in the mechanism of specific bacterial agglutination [water], **184** ; serum agglutination, **430**, **614** ; rapid milk and blood tests, **267** ; physical properties and agglutinability of plate antigens, **211** ; rapid stained antigen slide test, **390** ; spot method of conducting whole blood tests with stained antigen, **615** ; interpretation of titres, **184**, **235**, **390**, **477** ; flocculation test, **186**, **477** ; precipitation reaction, **186**.
See also Brucella infection, milk.
In dogs. In Italy, **369** ; suppurative epididymitis caused by *Br.a.*, **369**.
In goats. *Br.m.* in milk and cheese, **413**.
In horses, 61, **266**, **413** ; in France, **518** ; in Germany, **518** ; in Italy, **368** ; experimental infection, **368**.
Immunity. Nature of acquired immunity, **77** ; bacterial allergy and experimental infection of the lungs with *Br.a.*, **127** ; increase of allergy in the g. pig by inoculations of killed cultures of Brucella embedded in vaseline, **475** ; precipitin and complement fixation reactions of polysaccharide extracts of Brucella, **10** ; anti-Brucella serum fractions and agglutinins, **185**.
See also Brucella group, chemical composition.
Immunization. Vaccination with live culture, **344**, **460**, **517** ; vaccination, with dead culture, **368** ; calfhood vaccination, **108**, **460** ; uterine vaccination, **390** ; premunition against brucella infection of cattle with vaccine in a fatty base, **212**, **266** ; vaccination against *Br.m.* infection in goats, **579** ; use of g. pigs in immunization studies, **61**.
In man [undulant fever], 10, **63**, **213**, **266** ; in the U.S.A., **9** ; in South Africa, **10** ; in the Belgian Congo, **461** ; in Yugoslavia, **462** ; and allied fevers, **580** ; first progress report of the Undulant Fever Committee, Malta, **579** ; the frequency of agglutinins for *Br.a.* in the population at large, **109** ; *Br.a.* infection in Danish veterinarians, **266** ; latent infection, **580**.
In Milk. Detection of Brucella, **136** ; effect of infection of the udder on the quality of milk, **136** ; relation of blood and milk sera agglutination titres to udder infection, **412**.
In rats. In wild grey rats, **61** ; experimental infection, **61**.
In sheep. Hypersensitivity of lambs to *Br.a.* porcine type, **369**; experimental infection with *Br.a.* in sheep, **368** ; experimental infection with *Br.m.*, **265**.
In swine, 61, **266**, **579** ; infection of the brain, **459** ; in Italy, **368**.
See also Spondylitis.
Treatment. Chemotherapy, **195**.
Udder infection. See Brucella infection, in milk.
BRUCELLA MELITENSIS. See Brucella group ; Brucella infection.
BUFFALOES. See *Bacillus anthracis* infection; Blood, picture ; Bones, diseases ; *Stephanofilaria*.
BULBAR PARALYSIS, INFECTIOUS. See Aujeszky's disease.
BULGARIA. See *Bacillus anthracis* infection ; Reports, Bulgaria.
BUNOSTOMUM. Attachment of *B. trigonocephalum* to *Moniezia*, **611**.
BUSH SICKNESS. In New Zealand, **43**, **349**, **485** ; prevention by cobalt, **84**, **297** ; treatment, **297**, **551**.
See also Cobalt.
BYRES. Ventilation and heat economy, **298**.
See also Law, Turkey.

C

CALCIFICATION. See Bones, composition.
CALCIUM. Blood calcium and the calcium factor in blood coagulation, **251** ; variations in calcium content of the blood of horses, **251**, **447**.
See also Bones, general ; Milk fever ; Nutritional diseases ; Rickets.
CALLIPHORA. See Blowflies and fleshflies.
CALVES. Diseases of newborn cattle in Warsaw province, **29**.
See also *Bacterium alcalescens* ; Blood, picture ; Brucella infection, immunization ; Irradiation ; Kidneys, diseases ; Milk, nutritive value ; *Mycobacterium tuberculosis* infection, immunization, methods of infection ; Nutrition ; Poisoning, plant poisoning ; Rickets ; Salmonella infection, immunization ; Trembling disease.
CAMELS. Camels in health and disease, **151**, **648** ; diseases in Somaliland, **44**.
See also Cysts ; Gad-flies ; Therapeutics, protozoan diseases ; Trypanosoma infection, treatment.
CANADA. The Canadian Health of Animals Branch and its relation to public health, **451**.
See also *Clostridium botulinum* ; *Metorchis* ; Milk, hygiene ; Services, veterinary ; *Tropisurus*.
CANCER. See Neoplasms.
CAPILLARIA. Species parasitic in the upper digestive tract of birds, **539** ; earthworms as transmitters of *C. annulata*, **539**.
CARBON TETRACHLORIDE. Effect on sheep, **441**.
See also Helminth parasites, sheep parasites ; Poisoning, inorganic.
CARCASSES, ANIMAL, DESTRUCTION OF. Treatment of carcasses and meat products from the legal and prophylactic standpoint, **245**.
CARCINOMA. Rabies virus and Pearce's carcinoma, **600**.
CARIES. See Nutritional diseases ; Teeth.
CAROTENE. See Vitamins, vitamin A.
CAROTINAEMIA. Occurrence of carotinoids in animal sera, danger of mistaking carotinaemia for bilirubinaemia, **548**.
CASEOUS LYMPHADENITIS. See *Corynebacterium pseudotuberculosis* infection, in sheep [caseous lymphadenitis].
CASTRATION. Effect on the milk yield and flesh formation of cows, **38**.
See also *Mycobacterium tuberculosis* infection, immunity.
CATAPHORESIS. Studies in microcataphoresis, technique, electric charge of haemoflagellates, **647**.
CATARACT. See Eyes, diseases.
CATARRH. Infectious respiratory catarrh of army horses, **344** ; infectious catarrh of mice, **519**.
Malignant bovine, 293 ; in Rumania, **395** ; transmission experiments, **21**.
CATS. Rat bite fever from a cat, **23** ; plague carrier, **576** ; new virus disease, **345**.
See also Enteritis ; Eyes, general ; Gastro-enteritis infectious, feline ; Laryngo-enteritis, infectious ; Leptospira infection ; Lice ; *Mycobacterium tuberculosis* infection, in cats ; Oestrus ; Parasitic infestation general ; Trichophyton infection ; Trypanosoma infection, general.
CATTLE.
General. See Calves ; Technique, blood.
Arthropod parasites. Spinal meningitis caused by a warble fly larva, **76**.
See also Glossina ; Mange ; Oestridae ; Parasitic infestation, general ; Repellents ; Ticks.
Bacterial diseases. See Bacteria, general ; Brucella infection, in cattle ; Mastitis ; *Mycobacterium paratuberculosis* infection [Johne's disease] ; *Mycobacterium tuberculosis* infection ; Pasteurella infection, in cattle ; Salmonella infection.
Diseases general. In Germany, **290** ; pituitary lesion in hairy cows a sequel to foot and mouth disease, **628**.
See also Anaemia ; Catarrh, malignant bovine ; Cattle, genital system ; Circulatory system ; Encephalitis ; Grass tetany ; Haematuria ; Haemoglobinuria ; Ketosis ; Leucosis, bovine ; Milk fever ; Nutritional diseases ; Nymphomania ; Papilloma ; Placenta, retention of ; Pneumo-lymphadenitis ; Pyelonephritis ; Skin, diseases ; Sterility ; Teratology ; Trauma.
Fungous diseases. See Fungi ; Granuloma.
Genital system. See Abortion ; Genital system, diseases ; Insemination, artificial ; Placenta ; Pregnancy, diagnosis ; Pregnyl ; Sex hormones ; Staphylococcus ; Sterility ; Trichomonas infection, bovine.
Helminth parasites. See Helminth parasites, cattle parasites ; and under names of helminths.
Metabolism. See Calcium ; Phosphorus ; Rickets ; Tetany ; Vitamins.
Physiology. Factors affecting the growth of range cattle in semiarid regions, **38** ; effect of castration on the milk yield and flesh formation of cows, **38** ; hump of African cattle, **87** ; growth curves of native cattle in Tanganyika, **646**.
See also Bile ; Blood, picture ; Chemical composition ; Bones, diseases ; Cerebrospinal fluid ; Digestive system, general ; Eyes ; Heart ; Kidneys ; Magnesium ; Nervous system, general ; Nutrition ; Scrotum ; Testis.
Poisoning. See Poisoning ; Venoms.
Protozoan diseases. See Anaplasma infection ; Babesia infection ; Leptospira infection ; Rickettsia ; Theileria infection ; Therapeutics, protozoan diseases ; Trichomonas infection, bovine ; Trypanosoma infection, in cattle.
Virus diseases. See Aujeszky's disease ; Exanthema, vesicular ; Foot and mouth disease ; Leucosis ; Pleuro-pneumonia, contagious bovine ; Rinderpest.
CATTLE PLAGUE. See Rinderpest.
CELL INCLUSION DISEASE. In fowls, **117**.
CELLS. Cytology of multinucleated giant cells, Golgi-apparatus and microincineration, **255**.
CENSUSES, LIVESTOCK. See Livestock populations.

CENTRAL NERVOUS SYSTEM. See Nervous system.
CENTRIFUGATION. An airdriven ultracentrifuge for molecular sedimentation, **198** ; high speed vacuum centrifuge for the study of filterable viruses, **449** ; new method of sedimentation of bacteriophages, proteins and viruses, **381**.
CEPHALOMYIA. See Oestridae, bots.
CEPHALOPSIS. See Gad-flies.
CEREBROSPINAL FLUID. Changes in equine encephalomyelitis, **115** ; examination in cattle, **348**.
See also Encephalomyelitis, equine ; Trembling disease.
CESTODES, GENERAL. Possible antagonism between cestode infestation and tuberculosis, **434**.
See also Anthelmintics ; *Cysticercus* ; *Diphyllobothrium* ; *Echinococcus* ; Fimbriariinae ; *Hymenolepis* ; *Moniezia* ; *Raillietina* ; *Taenia*.
CEYLON. See Reports, Ceylon.
CHABERTIA. Pathogenic importance of *Ch. ovina*, **387** ; fourth stage larva of *Ch. ovina*, **541**.
CHAGAS' DISEASE. See *Trypanosoma cruzi* infection.
CHEMOTHERAPY. See Therapeutics.
CHICKENS. See Fowls.
CHINA. See Helminth parasites, general ; Leishmania infection ; *Paragonimus*.
CHLORINE. See Disinfectants.
CHLORPICRIN. Use in treatment of mange, **639**.
CHOEROSTRONGYLUS. The biology of *Ch. pudendotectus*, a lungworm of pigs, **337**.
See also *Metastrongylus*.
CHOLESTEROL and immunity, **25**.
CHORIO-ALLANTOIC MEMBRANE. See Embryo ; Viruses, cultivation [egg embryo].
CIRCULATORY SYSTEM. Calcification of the aorta in cattle and horses, **347**.
See also Trauma.
CIRCLING DISEASE OF SHEEP, 43.
CIRRHOSIS. See Liver, diseases general.
CLAVICEPS PASPALI. See Poisoning, plant poisoning.
CLIMATE. See Blood, picture.
CLINOSTOMUM. In a chicken, **610**.
CLONORCHIS. Second intermediate hosts, **281**.
CLOSTRIDIUM. Production of toxin by *Bacillus oedematis maligni* (*Vibrion septique*), **322** ; serological behaviour of *Cl. welchii*, **415** ; antigens of *Cl. welchii*, **581** ; metabolism of *Clostridium*, coupled reactions between pairs of amino acids induced by *Cl. sporogenes*, **583**.
CLOSTRIDIUM INFECTION, GENERAL.
General, 520, 521 ; anaerobic infections in domestic animals in the Dutch East Indies, **11** ; *Cl. welchii* in animal pathology, **521** ; blackleg and its complications, **522** ; production of immunity to *Cl. chauvoei*, **582** ; parturient blackleg and gas oedema, **63** ; blackleg as a gas oedema disease, **521** ; immunological relationship between blackleg and para-blackleg, **63**.
In horses. *Cl. histolyticum* infection in the horse, **321** ; *Cl. welchii* Type B infection in a foal, **581**.
Immunization. Duration of immunity of horses against tetanus following immunization with alum tetanus toxoid, **371** ; vaccination against enterotoxaemia, blackleg and black disease in Australia, **372** ; "holoserum" against the *Cl. welchii* group, **27, 160**; official United States and international unit for standardizing gas gangrene antitoxin, **27** ; efficiency of lamb dysentery serum, **432**.
See also Clostridium infection, in sheep.
In sheep. Braxy, **521** ; in Iceland, **521** ; bradsot in Italy, **373** ; enterotoxaemia, **12, 321, 414** ; infectious enterotoxaemia and pulpy kidney in lambs, **321** ; pulpy kidney in New Zealand, **214** ; transmission of antitoxic immunity from the ewe, vaccinated against enterotoxaemia to the lamb, **111** ; vaccination of ewes against infectious enterotoxaemia in lambs, **269** ; bloedpens [lamb dysentery] in South Africa, **213** ; mammary gas gangrene in ewes, **581** ; dipping mortality associated with *Vibrion septique* infection, **370** ; *Cl. welchii*, Type C, Wilsdon (*B. paludis*, McEwen) isolated from sheep in North Wales, **110**.
Toxin. Relationship between the toxins of staphylococci and of the gas gangrene group, **392** ; production of toxin by *Cl. oedematiens* (*B. novyi*), **581** ; physiological action of *Cl. welchii* toxins, **160** ; vitamin B-deficiency and resistance to the toxin of *B. welchii* in rats, **160** ; histological lesions in small animals after intravenous inoculation with *Cl. welchii* toxin, **582** ; effect on *Cl. welchii* toxins of a substance present in the normal intestine, **160** ; pathological changes produced by the toxin of *Vibrion septique* in animals, **414, 462**.
CL. BOTULINUM. Influence of temperature on growth and toxin production, **582**.
CL. BOTULINUM INTOXICATION [BOTULISM]. *Cl.b.* type C in relation to duck sickness in Alberta, **161** ; in sheep in Western Australia, **269** ; in man, **322** ; toxin and antitoxin, **161, 478**.
CL. CHAUVOEI. See *Clostridium* ; Clostridium infection.
CL. HISTOLYTICUM. See *Clostridium* ; Clostridium infection.
CL. OEDEMATIENS. See *Clostridium* ; Clostridium infection, immunization.
CL. PALUDIS. See Antigens, in fatty or oily bases.
CL. PERFRINGENS. See *Cl. welchii*.
CL. SEPTIQUE. See Antigens, in fatty or oily bases ; *Clostridium* ; Clostridium infection, in sheep.
CL. TETANI INFECTION. In horses, **415** ; naturally acquired immunity in ruminants, **371** ; immunization of army horses with anatoxin, **237** ; susceptibility of horses after single and double inoculation with tetanus anatoxin, **214** ; anatoxin, immunity of the mare and foal, **371** ; local reaction after injection of anatoxin, alone or in a lanoline base, **371** ; comparison between the stimulating effects of tapioca and aluminium hydroxide added to anatoxin for immunizing horses, **371**.
See also Vaccination.
CL. WELCHII. See Antigens, in fatty or oily bases ; *Clostridium* ; Clostridium infection general.
CLOVER POISONING. See Poisoning, plant poisoning.
COBALT. Limonite for stock-lick purposes, **443** ; effect of feeding to rats, **249** ; physiological aspects of the problem, **485** ; status of New Zealand soils, **485** ; status of animal organs from South Island drench experiments, **485** ; influence of top-dressing on the status of pasture plants, **485** ; colorimetric determination in soils and animal organs, **495**.
See also Bush sickness.
COCCIDIOSIS. See Eimeria infection.
COCHIN-CHINA. See *Dirofilaria*.
COCHLIOMYIA. See Blowflies and fleshflies.
COLIC. Causes of colic in horses, **293** ; influence of dietetics on gastro-intestinal disease of army horses, **293**.
COLLEGES. Instructional and research farm at Klein-Ziethen for the Berlin Veterinary College, **40** ; establishment and growth of the college of Veterinary Science, Philippine Islands, **98** ; Norway's veterinary college, **305** ; veterinary college of Sweden, **305**.
See also Reports, United States of America ; Research institutes.
COLLODION MEMBRANES. See Filtration.
COLOMBIA. See Haematuria ; Reports, Colombia.
COMMITTEES. Reports of the American Veterinary Medical Association Committee on Legislation, Committee on Proprietary Pharmaceuticals, Committee on Resolutions, Committee on Veterinary Biological Products, Committee on Education, **454**.
COMPLEMENT-FIXATION. Relation of the complement fixation optimum to the agglutination optimum, **286**.
See also *Echinococcus* ; Influenza, general ; *Mycobacterium tuberculosis* infection, diagnosis ; Pleuropneumonia, contagious bovine ; *Trypanosoma cruzi* infection [Chagas' disease] ; *Trypanosoma equiperdum* infection [dourine].
CONFERENCES. Twelfth Conference of Medical ResearchWorkers Calcutta, 1934, **203** ; Sixth Conference of Preventive Medicine, Czechoslovakia, 1936, report of Veterinary Section, **150**.
CONGRESSES. Third International Congress of Comparative Pathology, 1936, reports, **657** ; report of proceedings of the International Society for Microbiology Second International Congress for Microbiology, London, **561** ; 6th World Poultry Congress 1936, **495** ; report of the Veterinary Congress, Bogotá 1936, Colombia, **560**.
CONJUNCTIVITIS. See Eyes, diseases.
CONVENTIONS. See Law, international.
COOPERIA. Fatal effect of heavy infestation with *C. curticei* in goats, **124**.
COPPER. Presence in lamb's livers, **447** ; treatment of anaemia, **442**.
See also Helminth parasites, sheep parasites.
CORNSTALK DISEASE. Studies on cornstalk disease in horses, **262, 317, 318**.
CORPUSCLES, BLOOD. See Blood, corpuscles.
CORYNEBACTERIA. Pneumonia in foals due to *Corynebact. equi*, **573**.
CORYNEBACTERIUM PSEUDOTUBERCULOSIS INFECTION. Aetiology route of infection and prophylaxis of caseous lymphadenitis in sheep, **458** ; broncho-pneumonia in colts associated with *Corynebact. pseudotuberculosis*, **458**.
CORYNEBACT. PYOGENES INFECTION. Prevention in cattle, **411**.
CORYZA, AVIAN, 7, 262 ; uncomplicated coryza of fowls, **519** ; *Haemophilus gallinarum* causing coryza in fowls, **520** ; ultrafiltration experiments with the virus of coryza, **380**.
See also *Haemophilus gallinarum* infection.
COUNCILS. Council for Scientific and Industrial Research. Ten Years of Progress, 1926-1936, **495**.
See also Reports, Great Britain.
COWPOX. See Vaccinia.
CRENOSOMA INFECTION. *C. vulpis* from the respiratory tract of dogs and foxes, **24**.
CROTALARIA. See Poisoning, plant poisoning.

CRUSTACEA. See Hosts, intermediate.
CRYPTOCOCCUS FARCIMINOSUS INFECTION [EPIZOOTIC LYMPHANGITIS]. In a mule, **373**.
CRYPTORCHIDISM. Inheritance in sheep, **630**.
CUBONI'S PREGNANCY TEST. See Pregnancy, diagnosis.
CULICOIDES. See *Dirofilaria*; Mosquitoes.
CULTIVATION OF MICROORGANISMS. See Bacteria general, technique [cultivation]; Viruses, cultivation, and under name of specific organism.
CULTURE MEDIA. See Media.
CYPRUS. See Reports, Cyprus.
CYSTICERCUS. *C. bovis* and its prevention, **611**; in sheep, **539**; evagination of bovine cysticerci and their migration in man, **539**; in swine in Yugoslavia, **386**; *C. cellulosae* in the monkey, **430**; precipitation test for cysticercosis of pork, **124**; acquired active immunity in the ox to *C. bovis*, **124**.
See also *Taenia*.
CYSTS. Congenital umbilical cysts in swine, **131**; connection between ovarian cysts and brucellosis in cows, **578**; cutaneous cysts in camels, **482**.
See also *Cysticercus*; *Echinococcus*.
CZECHOSLOVAKIA. See Myelitis; Rabies, general; Reports, Czechoslovakia; Swine fever; Trichomonas infection, bovine.

D

DEER. See Helminth parasites, deer parasites; Ticks.
DEFICIENCY DISEASES. See Avitaminosis; Bones, diseases; Bush sickness; Goitre; Nutritional diseases; Perosis; Rickets; Scurvy.
DEMODECTIC MANGE. See Mange.
DENMARK. See Brucella infection; Fowl paralysis; Law, Denmark; *Mycobacterium tuberculosis* infection, in swine; Oestridae, warbles; *Salmonella pullorum* infection [bacillary white diarrhoea]; Trichomonad, infection, bovine.
DENTITION. See Teeth.
DERMACENTOR. See Brucella infection.
DERMANYSSUS. See Mites.
DERMATITIS, CONTAGIOUS PUSTULAR. Of sheep, **116**.
DERRIS. See Mange; Oestridae, warbles; Ticks.
DIABETES. Renal diabetes in domestic animals, **130**.
See also *Mycobacterium tuberculosis* infection, general.
DIAGNOSIS. Clinical diagnosis of internal diseases of domestic animals, **151**, **504**; field and laboratory diagnosis of sheep diseases, **543**; laboratory practice, **660**.
See also Books; Cerebrospinal fluid; Pregnancy; Radiography; Tests, and also under names of specific diseases.
DIARRHOEA. Of livestock on the teart pastures of Somerset, **296**.
DIARRHOEA, BACILLARY WHITE. See *Salmonella pullorum* infection.
DICROCOELIUM. Treatment of *D. lanceatum* infestation by trivalent antimonials, **353**.
DIET. See Metabolism; Nutrition.
DIETARY DEFICIENCY. See Nutritional diseases.
DIGESTIVE SYSTEM.
Diseases. Digestive disorders in piglets, **240**.
See Clostridium infection (enterotoxaemia); Colic; Diarrhoea; Enteritis; Gastro-enteritis; Helminth parasites; Laryngo-enteritis; Parasitic infestation.
Flora. Connection between protozoa of the rumen and tympany, **592**.
See also Intestines, flora.
Physiology. Weight, size and contents of the omasum of cows, **140**; fat formation in the rumen of sheep, **493**; osmotic pressure of the contents of the stomach compartments of the sheep, **493**; stimulation of the gastric glands in the horse, **644**; influence of bowel anastomosis on the nutritional state of merino sheep, **86**.
DIOCTOPHYME. Localization of *D. renale*, **285**; *D.r.* in the thorax of a cat, **232**.
DIPHTHERIA, FOWL. See Pox, in fowls.
DIPHYLLOBOTHRIUM. Comparative studies on species, **386**; eggs and the coracidia of *D. latum*, **385**; *Bothriocephalus* in north-east Russia, **385**.
DIPTERA. See Anaemia, equine infectious; Blowflies and flesh-flies; Glossina; Haematopota; Oestridae; Simulium; Stomoxys.
DIROFILARIA. *D. immitis* in the subcutaneous tissues of the leg and foot of a dog, **339**; *D. i.* and its microfilariae in dogs in Cochin-China, **541**; *D.i.* Leidy and its culicine intermediate hosts in Manila, **474**; chemotherapy of *D.i.* infestation, **298**; treatment of canine filariasis with "Fouadin", **298**.
DISEASE CONTROL. Control of infectious diseases, **238**; control of chronic infections in Switzerland, **291**; principles of sanitary legislation, **304**.
See also Law; Services, veterinary.
DISEASES, GENERAL UNSPECIFIED. Research on constitution and disease control in animal breeding, **48**; livestock disease situation in Europe in 1935, **255**; survey of the incidence and distribution of tropical and other diseases, **237**; important diseases of game animals, **238**; causes of death in animals in zoological gardens, **342**; effect of pH on the development and course of infections of animals, **80**.
See also under name of animal and under name of organ.
DISEASES, INHERITED. Research on constitution and disease control in animal breeding, **48**; hereditary diseases in horses, **435**; inheritance of cryptorchidism in sheep, **630**; congenital umbilical cysts in swine, **131**; inherited cataract in dogs, **189**; hereditary lethal for localised motor and preganglionic neurones with a resulting paralysis in the dog, **627**.
See also Abortion; Babesia infection, equine; Cysts; Fowl Paralysis; Law, Great Britain; Teratology; Twins.
DISINFECTANTS. Disinfection of metal cages and earthenware vessels, **196**; modern methods of disinfection, **249**; testing of disinfectants, **442**; value of common disinfectants in watery and protein solutions, **248**; chlorine disinfectants—their role in combating communicable diseases, **552**; bactericidal action of phenol and merthiolate used alone and in mixtures, **354**; use of cutaneous staphylococcus lesions in mice for the evaluation of the germicidal activity of disinfectants, **638**.
See also Antiseptics; Milker's ointments; *Salmonella pullorum* infection.
DISTEMPER, DOG. Treatment by intravenous administration of hydrochloric acid, **300**; specific homologous serum, **391**; titration of antiserum, **392**; inactivating effect of artificial subcutaneous infiltration on distemper virus, **427**.
DISTOMATOSIS. See *Fasciola*.
DOGS.
Arthropod Parasites. See Mange; Parasitic infestation, general; Ticks.
Bacterial Diseases. See *Actinomyces*; Brucella infection, in dogs; *Mycobacterium tuberculosis* infection, in dogs; Streptococcus infection, general.
Diseases general. See Cataract; Prostate gland.
Fungous diseases. See Ringworm.
Genital system. See Brucella infection, in dogs; Oestrus; Pregnyl.
Helminth parasites. See Helminth parasites, dog parasites, and under name of helminth.
Physiology. Experimental and clinical studies of the spine of the dog, **99**.
See also Blood, corpuscles [red]; Coagulation; Eyes.
Poisoning. See Poisoning; Venoms.
Protozoan diseases. See Babesia infection, canine; Eimeria Infection, canine; Entamoeba infection; Leishmania infection; Leptospira infection.
Virus diseases. See Borna disease; Rabies; Viruses, dog viruses.
DOPING OF HORSES. Detection of doping in racehorses, **399**.
DOURINE. See *Trypanosoma equiperdum* infection.
DRUGS. See Therapeutics, and under name of specific disease.
DUCKS. See *Cl. botulinum*; Food poisoning; *Mycobacterium tuberculosis* infection, tuberculin test; Poisoning, selenium; Salmonella infection, in ducks; *Salmonella pullorum* infection; *Tropisurus*.
DURAN-REYNALS FACTOR. See Permeability of tissues.
DUTCH EAST INDIES. Control of bovine tuberculosis in the Dutch East Indies, **513**.
See also Bacteria general; Brucella infection, in cattle; Bile; Clostridium infection general; Pasteurella infection [haemorrhagic septicaemia], general.
DUTCH WEST INDIES. See Reports, Dutch West Indies.
DYES. See Staining; Vaccinia.
DYSENTERY. Use of acidophilus milk in the treatment of young animals, **551**.
See also Clostridium infection, in sheep; Entamoeba infection.
DYSTOPIA. See Teratology.

E

EARS. Transmission of Argentine equine encephalomyelitis by the external auditory meatus, **175**.
EAST COAST FEVER. See Theileria infection.
ECHINOCOCCUS. In New Zealand, **284**, **385**; in Hungary, **284**; in Syria, **283**; in Holland, **385**; diagnosis in domestic and wild animals by the complement-fixation reaction, **283**.
ECHINOPARDALIS. Double encystment of young forms of *Echinorhynchus*, **339**.
ECHINOPARYPHIUM. *E. paraulum* causing fatal enteritis in pigeons, **24**.
ECHINOSTOMATIDAE. Encystation and development of *Echinostomidae*, **281**.
See also *Echinoparyphium*.

ECTASIS. Capillary ectasis of the liver in the large domestic animals, **128**.
ECTOPIA CORDIS. See Teratology.
ECTROMELIA, INFECTIOUS. See *Streptobacillus*.
ECZEMA. Dry seborrhoeic eczema in the horse, **396**.
EDUCATION. Veterinary education in Japan, **450**.
See also Colleges ; Committees ; Research institutes ; Services, veterinary.
EGGS. "Floating yolk" in hens' eggs, **314**.
General. See Food poisoning, eggs ; Salmonella group, viability.
Cultivation of viruses in. See Viruses, cultivation [Egg embryo].
Duck. See Food poisoning.
Helminth. See Helminth parasites, and under names of specific helminths.
EGYPT. See Food poisoning, meat poisoning ; Inclusion bodies ; Pasteurella infection, in fowls [Fowl cholera].
EIMERIA INFECTION [COCCIDIOSIS].
Avian, 592 ; age resistance of the chicken to *Eimeria tenella*, **270** ; chicken as a carrier of the oocysts of *E.l.*, **270** ; factors influencing the course of, **419** ; presence in laying pullets of the parasite causing coccidiosis in young chickens, **465** ; renal coccidiosis of geese in the U.S.S.R., **14** ; chronic isosporan infections in the sparrow, **522** ; oocyst production, dilution count technique, **522**.
Canine, 15.
In Foxes, 15.
Porcine. In the U.S.S.R., **15**.
In rabbits, 327 ; effects of chemicals on oocysts of *E. perforans*, **441**.
In reindeer, 327.
Treatment. Effect of sulphur in chickens, **270**.
ELECTRIC STUNNING. See Slaughter.
ELECTROPHORESIS. In *Brucella* **11**.
See also Cataphoresis.
ELEPHANTS. Physiology, **251**.
ELK. Leptomeningitis mycotica in an elk, **81**.
EMBRYO. Active immunity of the embryo, **287** ; factors influencing the malposition among embryos of fowls, **189**.
See also Foetus ; Viruses, cultivation [egg embryo].
ENCEPHALITIS. In foxes, **176**, **225**, **226**, **483** ; turning sickness, a protozoan encephalitis of cattle in Uganda, its relationship with east coast fever, **169** ; of piglets in the U.S.S.R., **131** ; disease of horses caused by feeding mouldy corn, **623** ; "sterile encephalitis" in laboratory animals, **131**.
See also Nervous system, diseases.
ENCEPHALOMALACIA. The prevention in chicks by vegetable oils and their fractions, **399** ; brain weight and moisture content in normal chicks and those with nutritional encephalomalacia, **549**.
ENCEPHALOMYELITIS.
General. Post-inoculation infection in rabies, **601** ; spontaneous infection of mice, **602**.
ENCEPHALOMYELITIS, EQUINE.
General. Various forms, **115** ; in the U.S.S.R., **72**, **115** ; in Panama, **423** ; epidemiology and control, **598** ; changes in the cerebrospinal fluid and blood, **115** ; research, **175** ; produced experimentally by subarachnoidal infection, **21**.
See also Blood corpuscles [white] ; Borna disease.
Diagnosis, 115 ; Significance of inclusions in the nerve cells of the brain, **424** ; blood picture and urine analysis, **21**.
Immunization. Vaccination, **18** ; active immunization of g. pigs with the virus, **175**.
Transmission. By mosquitoes, **175** ; by the external auditory meatus, **175** ; to the stork, **423**.
Virus. Nature of, **175** ; growth on egg embryo, **526** ; site of, **599** ; viability, **19**, **72**.
ENCEPHALOMYELITIS ENZOOTICA SUUM. Changes in the central nervous system, **71**.
ENDOCARDITIS. See Heart, diseases.
ENDOCRINE SYSTEM. Present position of endocrinology, **645** ; glandular physiology and therapy, symposium prepared for the Council on Pharmacy and Chemistry of the American Medical Association, **100** ; endocrine control of the mammary gland, **197**.
See also Adrenal gland ; Bones, general ; Pineal gland ; Pituitary gland ; Sex hormones ; Thymus gland ; Thyroid gland.
ENDOMETRIOSIS. In cattle, **396**.
ENDOMETRITIS. See Uterus, diseases.
ENTAMOEBA INFECTION. Entamoeba histolytica in dogs, **162** ; in wild rats in Baltimore, **162** ; amoebic dysentery in dogs, **324** ; X-ray diagnosis of amoebiasis, **162**.
ENTERITIS. Occurrence in cats and transmission to man, **628**.
See also Digestive system, diseases.
ENTEROHEPATITIS, INFECTIOUS. See *Histomonas meleagridis* infection [blackhead].
ENTEROTOXAEMIA. See Clostridium infection.
ENTOMOLOGY. See Arthropods ; Blowflies ; Diptera ; Fleas ; Flies ; Glossina ; Invertebrate vectors of disease ; Lice ; Mange ; Parasites infestation, general ; Technique, entomological ; Ticks.
"ENTOZON". See Mastitis, treatment.
ENZYMES. Role of enzymes in anaphylaxis and sensitization, **79**.
See also Bacteriophage ; Digestive system.
"EPIPHYSAN". See Pineal gland.
EPITHELIOMA. Localization of fowl plague virus in the cells of mouse epithelioma, **178**.
See also Carcinoma ; Papilloma ; Pox diseases, in fowls.
EPIZOOTIC LYMPHANGITIS. See *Cryptococcus farciminosus* infection.
EQUINE ENCEPHALOMYELITIS. See Encephalomyelitis, equine.
EQUINE INFECTIOUS ANAEMIA. See Anaemia, equine infectious.
EQUINE MYOGLOBINURIA PARALYTICA. See Myoglobinuria paralytica, equine.
ERGOT. Poisoning of sheep by ergotised *Paspalum dilatatum*, **42** ; ataxia in cattle fed on paspalum affected with *Claviceps paspali*, **86**.
ERYSIPELOTHRIX RHUSIOPATHIAE. Smooth and rough forms, **574** ; effect of ultra-violet rays, **64**.
ERYSIPELOTHRIX RHUSIOPATHIAE INFECTION [SWINE ERYSIPELAS], 573 ; pig louse (*Haematopinus suis*) as a carrier of infection, **121** ; need for alteration of the Reich meat inspection regulations regarding skin lesions, **438** ; antigen for the agglutination test, **107** ; influence of nutrition on experimental infection, **57** ; in man, **108** ; in sheep, **366** ; in rats, **514**.
ERYTHROBLASTOSIS. See Leucosis, avian.
ERYTHROCYTES. See Blood, corpuscles [red].
ESTONIA. See Brucella infection, control ; Reports, Estonia.
EUCOLEUS. *E. aerophilus* from the respiratory tract of dogs and foxes, **24**.
EXANTHEMA VESICULAR. Of swine, **114**, **422**.
EXOTUBERCULIN. See *Mycobacterium tuberculosis* infection, tuberculin test.
EYES.
General. Blood vessels of the fundus oculi of the horse, cow, sheep, goat, pig, cat, dog, and rabbit, **87**.
Diseases. Periodic ophthalmia, **30**, **544** ; periodic ophthalmia in horses after influenza, **239** ; cancer of the conjunctiva in cattle, **240** ; inherited cataract in dogs, **189** ; aetiology and pathogenesis of enzootic conjunctivitis in the horse, **436** ; verminous ophthalmia of horses in Indochina, [*Setaria*], **612** ; verminous conjunctivitis in fowls, **612** ; primary irido-cyclitis in fowls, distinct from eye lesions occurring in neurolymphomatosis, **626** ; myiasis of the eyes in man, **429**.
See also Rabies, virus.

F

FAECES. Chemical analysis of horse faeces, **401**.
See also Bacteriophage ; *Brucella abortus* infection, diagnosis.
FALKLAND ISLANDS. See Reports, Falkland Islands.
FASCIOLOIDES. *F. magna* a parasite of ruminants, **281**.
FATS. Fat content of body organs in bovine TB., **4**.
FEATHERS. See Arthropods.
FEDERATED MALAY STATES. See *Mycobacterium tuberculosis* infection, in swine ; Pasteurella infection, in fowls [fowl cholera] ; Reports, Federated Malay States ; Stomatopharyngitis, diphtheric.
FERMENTS. See Enzymes.
FERTILITY. See Breeding ; Sterility.
FIBROMA. Transmission of the Shope virus of rabbits, **180** ; relationship between myxoma, neuromyxoma and fibroma viruses, **605** ; Shope's infectious, of rabbits, **605**.
See also Myxoma ; Papilloma.
FIJI. See *Mycobacterium tuberculosis* infection, in swine ; Reports, Fiji.
FILARIAE. Microfilariae of fowls in India, **171** ; microfilariasis in dogs in Italy, **183** ; of horses in Greece, **541** ; value of formol-gelification in diagnosis of canine filariasis, **184**.
FILMS. Catalogue of British medical and veterinary films, 1936-1937, **506**.
FILTRATION. Filter candles for preparing bacteria-free filtrates, **449** ; ultrafiltration and probable dimensions of the viruses of foot and mouth disease and vesicular stomatitis, **470**.
See also Coryza, avian ; Fowl plague ; Laryngotracheitis ; Rabies, virus.
FIMBRIARIINAE, 538.
FINLAND. See Reports, Finland.
FISTULOUS WITHERS. Brucella infection in fistulous withers and other surgical conditions in the horse, **413**.
FLEECE. A freak merino fleece, **31**.

FLIES. See Anaplasma infection, general ; Blowflies and fleshflies ; Diptera ; Helminth parasites, transmission ; Oestridae ; Repellents.
FLOCCULATION. See Brucella infection, diagnosis [general].
FLUKES. See Trematodes.
FLUORINE. See Poisoning, fluorine.
FLY REPELLENTS. See Repellents.
FLY TRAPS. Mechanical insect traps, **182**.
FOALS. Origin of humoral immunity of the new born foal, **619** care of newborn foals, **629**.
See also Arthritis ; *Clostridium tetani* infection, immunization ; Horses ; Respiratory system, diseases.
FOETUS. Development of the "righting" movements in the foetal sheep, **447**.
See also *Brucella abortus*, viability ; Diseases, inherited ; Embryo ; Genital system.
FOOD INSPECTION.
Meat inspection. Textbook of meat inspection, **99** ; in Palestine, **452** ; hygiene in the bacon factory, **660** ; need for alteration of Reich meat regulations regarding skin lesions in swine erysipelas, **438** ; in relation to bovine tuberculosis, **492** ; meat of pigs infected with swine fever, **70** ; precipitation test for cysticercosis of pork, **124** ; for trichinella in Poland, **439** ; internal parasites in relation to meat supplies, **352**.
See also Carcasses, animal, destruction of ; Reports, Holland ; Slaughter.
Milk. See Milk, hygiene.
FOOD POISONING. Transmission by a bovine cured several months previously, **329**.
Eggs, 351 ; from ducks' eggs, **245, 492**.
Meat poisoning. Statistics in Germany, 1935, **351** ; from pork infected with *Salmonella cholerae-suis* Kunzendorf, **634**; *S. typhimurium* infection, **351, 439** ; prevention of poisoning due to salmonella infection, **492**; demonstration of organisms by malachite green medium, **352** ; case of botulism in a man, **322**.
Milk products. Cheese poisoning, **84**.
FOOT AND MOUTH DISEASE.
General. In the Bechuanaland protectorate, 1934, **224** ; in Italy in 1935, **224** ; in Germany in 1936, **596** ; in the Danube Plain in 1932, **596** ; lesions of the sino-atrial node of the heart in foot and mouth disease, **224** ; mechanism of infection in the g. pig, **421**; heart lesions in g. pigs, **526**; pituitary lesion in hairy cows, sequel to foot and mouth disease, **628** ; research, **224**.
See also Exanthema, vesicular.
Immunization. With formolized virus in aluminium hydroxide, **17**; by a formolized vaccine, **596**; by virus in aluminium hydroxide, **329, 420, 421, 469, 527** ; immunization of g. pigs with polyvalent vaccines, **329** ; by a trivalent vaccine, **17** ; inactivating effect of artificial subcutaneous infiltration on virus, **427** ; with polyvalent vaccine and serum, **469** ; trials with antiserum, **224**.
In man. Natural transmission of the African virus from cattle to man and from man to man, **69**.
Cultivation. Symbiosis of virus with bacteria, **527** ; in tissue cultures on cellophane membranes, **528** ; in pure cultures of epithelial cells and fibroblasts, **528**.
Virus. Virus problem, **528** ; physical properties of purified virus, **470** ; effect on g. pigs of injection of virus in an oil emulsion, **329** ; adsorption of virus with aluminium hydroxide, **17** ; fate of virus injected subcutaneously after dilution with distilled water or adsorption by aluminium hydroxide, **329** ; in strong salt solutions, **420**.
See also Viruses, size of.
Treatment. With Finzi's "Chemoserum" (iodoarsenamidophenol in horse serum), **224**.
FORMOL-GELIFICATION TEST. Of various animal sera, **186**.
See also Filariasis ; *Salmonella abortus-equi* [Equine contagious abortion].
FORMOSA. See Ticks.
FOUADIN. See *Dirofilaria*.
FOWL CHOLERA. See Pasteurella infection, in fowls.
FOWL LEUCAEMIA, LEUCOSIS. See Leucosis, avian.
FOWL PARALYSIS, 32, 191, 626 ; cause and diagnosis, **132** ; incidence of blindness and paralysis in fowls according to family, **348** ; pathology, **397** ; in Austria, **133** ; control in Norway, **243** ; control in Denmark, **484** ; relation to leucaemia in chickens, **294** ; in relation to lymphomatosis, **294** ; comparison with scrapie in sheep, **625** ; active immunization, **484** ; research, **190**.
See also Leucosis.
FOWL PLAGUE.
General. Virus disease new to East Africa, **605** ; fowl plague and Newcastle disease, **279** ; methods of infection with the mouse strain, **178** ; transmission of fowl pest to ferrets, **605**.
See also Newcastle disease.
Immunization. Vaccination with irradiated virus, **179** ; infection and immunization of mice with virus adsorbed on aluminium hydroxide, **228** ; inactivating effect of artificial subcutaneous infiltration, **427**.
Virus. Localization in the cells of mouse epithelioma, **178** ; determination of size by ultrafiltration, **178** ; attenuation by X-rays, **179** ; variations in virus, **605** ; adapted to the mouse, **178** ; cellular changes in the livers of mice, **178** ; "cultures" of virus, **178** ; growth on egg embryo, **526**.
FOWL POX. See Pox, in fowls.
FOWL TYPHOID. See *Salmonella gallinarum* infection.
FOWLS.
General. 6th World Poultry Congress, 1936, **495**.
Arthropod Parasites. See Arthropods ; Mites ; Parasitic infestation, general.
Bacterial diseases. See *Bact. tularense* infection [Tularaemia] ; *Haemophilus gallinarum* infection ; *Mycobacterium tuberculosis* infection ; *Salmonella gallinarum* infection ; *Salmonella pullorum* infection ; Pasteurella infection in fowls.
Diseases general, 127, 291 ; in Holland, **341** ; in Sweden, **239** ; control, **341** ; relation of production to mortality, **543** ; review of the 1935-1936 laying trials mortality in the U.S.A., **342** ; incidence of blindness and paralysis according to family, **348** ; work of the Reich centre for research and control of poultry diseases at the Reichsgesundheitsamt, **543** ; report of Committee on Transmissible Diseases of Poultry U.S.A. Livestock Sanit. Ass., **543** ; factors affecting the incidence of malposition among embryos, **189**.
See also Bones, diseases ; Eyes, diseases ; Encephalomalacia ; Fowl paralysis ; Leucosis, avian ; Neoplasms ; Nutritional diseases ; Perosis ; Uropygial gland.
Helminth parasites. See Helminth parasites, fowl parasites.
Physiology. Influence of pituitary hormone on the thyroid gland, **88** ; relative value of farm grains in poultry nutrition, **553**.
Poisoning. See Poisoning.
Protozoan diseases. See Blood, corpuscles [white] ; Leucocytozoa ; Spirochaeta infection ; Trypanosoma infection, in fowls.
Virus diseases. Respiratory disease in chicks, caused by a virus, **22**.
See also Coryza, avian ; Poliomyelitis ; Pox, in fowls.
FOXES. Diseases, **343, 621** ; convulsions in silver foxes, **82**.
See also Books ; *Crenosoma* ; Eimeria infection ; Encephalitis ; *Eucoleus* ; Genital system, diseases ; Helminth parasites, fox parasites ; *Pseudamphistomum* ; Salmonella infection [paratyphoid], in foxes ; *Tocotrema*.
FRACTURES. See Bones, general.
FRANCAIELLA. Relationship between *Babesia bigeminum* and *Fr. colchica* in the U.S.S.R., **418** ; ticks as vectors of bovine francaielliasis, **591**.
FRANCE. See Anaemia ; Anaplasma infection ; Brucella infection, in horses ; Law, France ; Milk, hygiene ; *Mycobacterium tuberculosis* infection ; Reports, France ; Services, veterinary.
FREEZING. See Bacteria, general, technique [general] ; Viruses.
FRENCH GUIANA. Animal husbandry in, **90** ; stephanurosis in pigs, **76**.
FRENCH POSSESSIONS. See Algeria ; Cochin-China ; French Guiana ; Indochina ; Morocco ; Syria ; Tunis.
FUNGI.
General. See *Actinomyces* ; *Fusarium* ; *Gibberella saubinetii*.
Infection. Mycoses of mammals, **323** ; character of acquired immunity to mycoses, **323** ; leptomeningitis mycotica in an elk, **81** ; invasiveness of skin infections caused by fungi and subsurface mycelium, **374** ; granulomatous nasal swelling in a bovine, **189**.
See also Respiratory system, diseases ; Ringworm.
FUR ANIMALS. Diseases, **483** ; in Germany, **291** ; government research on diseases in the U.S.A., **483**.
See also Foxes.
FUR FARMING. See Books.
FUSARIUM. Pathogenic action of the plant-pathogenic fungi including *F. solani*, on animals, **65**.
FUSIFORMIS. Occurrence of *F. necrophorus* agglutinins in different species of animals, **340**.
See also Anaerobes.

G

GAD-FLIES. Biology of the camel gad-fly *Cephalopsis titillator* Cl., **382**.
See also Tabanids.
GAERTNER'S BACILLUS. See Salmonella group, differentiation.
GAS GANGRENE. See Clostridium infection.
GASES, POISONOUS. Protection of animals, **86, 563** ; veterinary aspect of gas warfare, **643**.
GASTRITIS, PARASITIC. See Stomach worms, and under name of worm.
GASTRO-ENTERITIS, INFECTIOUS FELINE, 116.
GASTROPHILUS. See Oestridae.

GEESE. See *Amidostomum*; Eimeria infection, avian; *Haemophilus*.
GENETICS. Principles of heredity, **47**; elementary genetics, **408**. See also Breeding.
GENITAL SYSTEM.
General. Oestrus and ovulation in mares, **645**; development of the "righting" movements in the foetal sheep, **447**.
See also Law, Great Britain; Ovary; Pregnyl; Sex hormones; Uterus; Vaccinia; Vagina.
Diseases. Transmissible genital infections in cattle, **545**; congenital TB., **51**, **54**; reproductive disorders of foxes, **189**.
See also Babesia infection; Brucella infection; Cryptorchidism; Endometriosis; Leucosis, bovine; Nymphomania; Sterility; Teratology; Trichomonas infection, bovine.
GERMANY. Police organization and veterinary administration in Germany, **40**; further state control of animal disease, **480**; animal welfare, **496**; campaign against sterility in mares, **481**; obligatory bovine sterility campaign in Thuringia, **481**; poultry health service of the Reich Nährstand, **496**; work of the Reich centre for research and control of poultry diseases at the Reichsgesundheitsamt, **543**; history of the development of the veterinary profession, **404**; history of veterinary affairs in the German colonies, **496**.
See also Anaemia, equine infectious, control; *Bacillus anthracis* infection, general; Brucella infection; Cattle, diseases general; Food poisoning, meat; Foot and mouth disease; Fowls, diseases general; Fur animals; Goats; History; Horses, diseases general; Law, Germany; Leucosis, bovine; Milk, pasteurization; *Mycobacterium tuberculosis* infection; *Opisthorchis*; Pica; *Prosthogonimus*; Psittacosis; Rabies, general, Reports; Research institutes; Sheep, diseases general; Sterility; Swine, diseases general; Trichomonas infection, bovine; Vermin control.
GIBBERELLA SAUBINETII [cause of scabby barley]. Pathogenicity and genetics, **65**.
GIGANTORHYNCHIDAE. See *Echinopardalis*.
GLANDERS. See *Pfeifferella mallei* infection.
GLOSSINA. Biology, **182**; distribution in Tanganyika Territory, **608**; food as determined by the precipitin test, **607**; *G. swynnertoni* Austen, in relation to various vegetation types, **334**; experiments on the crossing of open spaces by *G. swynnertoni*, **229**; *G. brevipalpis* and *G. austeni* in Italian Somaliland, **229**; seasonal spread of *G. pallidipes* in Italian Somaliland, **229**; experimental work with *G. palpalis* in Uganda, **333**; attempt to transmit *Trypanosoma gambiense* by *G. palpalis*, **215**; development of trypanosomes in Glossina, **416**.
See also Books; Reports, Southern Rhodesia; Trypanosoma infection.
GNATHOSTOMA. Life cycle of *Gn. spinigerum*, **387**.
GOATS. Diseases in Germany, **291**.
See also Babesia infection, caprine; Blood, coagulation; Brucella infection; Eyes, general; Heartwater; Helminth parasites, goat parasites; Lungworms; Mange; Milk, verification of animal of origin; Parasitic infestation, general; *Pfeifferella mallei* infection; Pleuro-pneumonia, of goats; Pox in goats; Stomatitis, contagious pustular; Swine Fever.
GOITRE. Aetiology, **397**; in pigs, **548**; relationship of the iodine contents of water, milk and pasture to the occurrence of endemic goitre, **295**.
GOLUBATZ MIDGE. See *Simulium*.
GRANULOCYTES. See Blood, corpuscles [white].
GRANULOMA. Roeckl's granuloma in cattle, **545**.
GRANULOSA CELL. Granulosa cell tumours in animals and their hormonal relationship, **396**.
GRASS SICKNESS. In horses, **481**; in Essex, **189**.
GRASS TETANY. In New Zealand, **43**; in a dairy cow, **241**; hypomagnesaemia in, **241**; treatment with "Calcimagon", **638**. See also Milk fever.
GREAT BRITAIN. See Babesia infection; *Bacillus anthracis* infection; Blowflies and fleshflies; Clostridium infection; Foot and mouth disease; Fowl paralysis; Helminth parasites; Laryngotracheitis; Law, Great Britain; Mange; Meat inspection; Milk, hygiene; *Mycobacterium tuberculosis* infection; Nutritional diseases; Oestridae, warbles; Reports; Streptococcus infection; Swine fever.
GREECE. See *Filariae*; Leishmania infection.
GROUPS, BLOOD. See Blood, groups.
GROWTH FACTORS. Factors affecting the growth of range cattle in semi-arid regions, **38**; substances promoting normal and abnormal growth, **297**; growth curves of native cattle in Tanganyika, **646**.
See also Nutrition; Rickets; Vitamins.
GUINEA PIGS. See under names of specific diseases.

H

HAEMAGGLUTINATION. See Agglutination.
HAEMATOLOGY. See Blood.
HAEMATOPINUS. See Lice.
HAEMATOPOTA. The cleg *H. pluvialis* and other horseflies, **280**.
HAEMATURIA. Chronic infection in Colombia, **436**; of cattle in Yugoslavia, **437**.
HAEMOCYTOBLASTOSIS. See Leucosis, avian.
HAEMOGLOBIN. See Blood, haemoglobin.
HAEMOGLOBINURIA. In draught cattle, **129**.
HAEMOGLOBINURIA, EQUINE. See Myoglobinuria paralytica, equine.
HAEMOLYSIS. See Blood, diseases; Streptococcus, haemolytic.
HAEMOPHILUS. Serological differentiation of *H. influenzae suis*, *H. influenzae*, human strain and *H. pertussis*, **317**; a strain isolated from geese, **317**.
See also *Streptobacillus*.
HAEMOPHILUS GALLINARUM. Causing coryza in fowls, **7**, **262**, **520**; cultural requirements, **7**.
HAEMOPHILUS INFLUENZAE. Bacterial influenza in mice, **317**; differentiation of influenza bacilli from pasteurella, **411**.
HAEMOPHYSALIS. See Ticks.
HAEMOPROTEUS. *H. columbae* of pigeons in India, **171**.
HAEMORRHAGE. Muscle haemorrhages in animals stunned by hammer, captive bolt or electricity, **491**.
HAEMORRHAGIC SEPTICAEMIA. See Pasteurella infection
HARMOSTOMUM. Infestation in swine, **281**; cercaria and metacercaria of a *Brachylaemus* from a pig, **335**.
HAWAII. See Parasitic infestation, general.
HEART.
General. Electrocardiograph and its clinical application in the horse, **648**.
See also Circulatory system; Sex hormones.
Diseases. Lesions of the sino-atrial node in foot and mouth disease, **224**; lesions in foot and mouth disease in g. pigs, **526**; ossification of the myocardium in a horse, **82**.
See also *Angiostrongylus*.
HEARTWATER. In Brazil, **471**.
HEARTWORM. See *Dirofilaria*.
HEDGEHOGS. See Influenza.
HELLEBORE VIRIDIS. See Poisoning, plant poisoning.
HELMINTH PARASITES.
General. Manual of medical and veterinary helminthology, **206**; introduction to nematology, **660**; developments in helminthology, **537**; parasites of poultry, wild birds and small mammals in South Wales, **608**; in Yugoslavia, **416**; in China, **281**; action of worm toxins on the animal body, **538**; crustacea as intermediaries, **537**; ova in sewage works, **609**; preservation of ova, **609**.
See also Eyes, diseases; *Mycobacterium tuberculosis*, infection, immunity; Nematodes, general; Parasitic infestation; Respiratory system, diseases; Schistosoma infection.
Bird Parasites. Lesions in birds of economic importance, **609**; in Western Yugoslavia, **385**.
Cat parasites. See *Dioctophyme*; *Opisthorchis*; *Paragonimus*; *Physaloptera*; *Trichinella*.
Cattle parasites. See *Cysticercus*; *Echinococcus*; *Filariae*; Lungworms; Nematodes general; *Onchocerca*; Parasitic infestation general; Stomach worms; *Taenia*; *Trichostrongylus*.
Deer parasites. Parasites from Trinidad deer, **609**.
Dog parasites. Helminthological survey of 1,315 dogs, **230**; treatment for canine whipworms, **247**.
See also *Alaria*; *Ancylostoma*; *Angiostrongylus*; *Ascaris*; *Crenosoma*; *Dioctophyme*; *Diphyllobothrium*; *Dirofilaria*; *Echinococcus*; Eucoleus infection; *Filariae*; Lungworms; *Metorchis*; *Oslerus*; Parasitic infestation general; *Taenia*; *Trichinella*.
Duck parasites. See *Tropisurus*.
Fowl parasites. Effect of certain chemicals on worm infested poultry runs, **353**.
See also Ascarids; *Clinostomum*; *Filariae*; *Hymenolepis*; *Oxyspirura*; *Prosthogonimus*; *Strongyloides*.
Fox parasites. See *Crenosoma*; *Eucoleus*; *Railletina*.
Goat parasites. Amphistome parasites from Allahabad, **183**; fatal effect of heavy infestation with *Cooperia curticei*, **124**.
Horse parasites, 430.
See also *Filariae*; Lymphatic system, diseases; Nematodes; *Onchocerca*; *Schistosoma*; *Setaria*; *Strongyloides*.
Immunity. See Immunity, metazoan.
Moose parasites, 482.

HELMINTH PARASITES [cont'd].
Sheep parasites. Incidence of the abomasal parasites in lambs of South-West Britain, **284**; incidence of abomasal parasites in fat lambs from the same flock, **608**; amphistome parasites of sheep from Allahabad, **183**; distribution of gastro-intestinal parasites in Queensland, **384**; in Russia, **335**; nematodes in Iceland, **353**; correlation between the worm burden and live-weight increase of grazing sheep, **284**; observations based on weekly parasite egg counts on faeces of lambs and yearling sheep, **284**; effect of salting pasture on the incidence of stomach worms, **284**.
See also Anthelmintics; *Cysticercus*; Lungworms; *Moniezia*; Nematodes, general; Stomach worms; Trichostrongylidae.
Swine parasites. See *Ascaris*; *Choerostrongylus*; *Cysticercus*; *Harmostomum*; Lungworms; *Metastrongylus*; *Oesophagostomum*; Parasitic infestation, general; *Stephanurus*; *Strongylus*; *Taenia*; *Trichinella*.
Technique. See Technique, helminthological.
Transmission. Of ova by flies, **538**.
Treatment. Internal parasites and parasitic diseases of sheep, treatment and control, **205**.
See also Anthelmintics, and under name of helminth.
Turkey parasites. Relative abundance of crop worms, **612**.
Viability. Effect of various solutions on helminth eggs in faeces, **610**.
HELMINTHOSPORIDIUM. See Fungi.
HENS. See Fowls.
HEPATITIS. See Liver diseases.
HEREDITY. See Diseases inherited; Genetics.
HERNIA. See Teratology.
HERPES VIRUS. Affinity for the epithelial elements of Shope's papilloma, **180**.
HETERAKIS GALLINAE. As carrier of *Histomonas meleagridis*, **523**, **524**.
HISTOMONAS MELEAGRIDIS INFECTION [BLACKHEAD]. Immunity produced by infection with attenuated culture strains, **523**.
HISTORY. Revelation of the life-history of the liver fluke as an illustration of the process of scientific discovery, **473**; establishment and growth of the College of Veterinary Science, Philippine Islands, **98**.
See also Germany.
HOG CHOLERA. See Swine fever.
HOLLAND. See *Bacillus anthracis* infection; Dutch East Indies; Dutch West Indies; *Echinococcus*; Fowls, diseases general; *Mycobacterium tuberculosis* infection, in man from animals; Salmonella infection, in pigeons; Reports, Holland.
HOOKWORMS. See *Ancylostoma*.
HOPPEGARTEN COUGH. See Bronchitis, infectious.
HORMONES. Treatment of impotence with anterior pituitary hormone, **136**; vitamins and hormones, **152**; granulosa cell tumours and their hormonal relationship, **396**; glandular physiology and therapy, **100**; treatment of hypersexuality in horses by "epiphysan", **37**.
See also Endocrine system; Growth factors; Milk fever; Pituitary gland.
Sex hormones. Demonstration of sex hormones in the placental fluid of cattle, **141**; units of sex hormones, **141**; follicular hormone, **506**; male sex hormones, **553**.
See also Oestrus; Pregnancy; Sterility; Twins.
HORSEFLIES. See Tabanids.
HORSES.
General. See also Allergy; Electrocardiogram; Parasitic infestation general.
Arthropod parasites. See *Haematopota*; Parasitic infestation; Oestridae; Tabanids; Ticks.
Bacterial diseases. See also Brucella infection, in horses; *Clostridium tetani* infection; *Corynebacteria*; *Mycobacterium tuberculosis* infection, in horses; *Salmonella abortus*, equine strain.
Diseases general. In Germany, **290**; ossification of the myocardium, **82**; neuritis caudae equinae, **127**; classification of respiratory diseases, **222**.
See also Catarrh; Conjunctivitis; Diseases, inherited; Encephalitis; Grass sickness; "Kumri"; Law, Great Britain; Myositis; Ophthalmia, periodic; Pyelonephritis; Respiratory system, diseases; Rheumatism; Ringbone; Roaring; Skalma; Skeletal disease; Skin diseases; Sterility.
Genital system. See Abortion; Pregnancy; Semen; Sterility; Uterus; Vagina.
Helminth parasites. See Helminth parasites, horse parasites, and under names of helminths.
Physiology. Nervous regulation of respiration, heart and blood pressure, **38**; stimulation of the gastric glands, **644**; partition of calcium and inorganic phosphorus in equine serum, **251**; chemical analysis of horse faeces, **401**.
See also Blood; Breeding; Circulatory system; Eyes; Heart; Nervous system, diseases; Oestrus; Prolan; Teeth.
Poisoning. See Poisoning, organic.
Protozoan diseases. See Babesia infection, treatment; Leishmania infection; Naganol; Therapeutics, protozoan diseases; Trypanosoma infection, general.
Virus diseases. See also Anaemia, equine infectious; Encephalomyelitis, equine.
HORSE-SICKNESS, AFRICAN, 330; neurotropic virus, antigenic response of horses to simultaneous trivalent immunization, **599**.
HOSTS, INTERMEDIATE. Earthworms as transmitters of *Capillaria annulata*, **540**; crustacea as helminth intermediaries, **537**.
See also Ants; *Clonorchis*.
HUMP. See Cattle, physiology.
HUNGARY. See *Echinococcus*; Trichomonas infection, bovine.
HYALOMMA. See Ticks.
HYDATID DISEASE. See *Echinococcus*.
HYDROCHLORIC ACID. See Bush sickness; Distemper, dog.
HYDROCYANIC ACID. Cyanogenetic glucoside content of linseed cake, **138**; sudan grass and other cyanophoric plants as animal intoxicants, **138**.
HYDROGEN ION CONCENTRATION. Effect of the pH on the development and course of infections of animals, **80**.
HYGIENE, GENERAL. Treatment of carcasses and meat products from the legal and prophylactic standpoint, **245**; hygiene in the bacon factory, **660**.
See also Byres; Carcasses, animal, destruction of; Food inspection; Milk, hygiene; Public health.
HYMENOLEPIS. The amphipod *Orchestia platensis* an intermediate host for *H. exigua* a tapeworm of chickens in Hawaii, **538**.
HYPERSENSITIVITY. See also Allergy; Anaphylaxis; *Mycobacterium tuberculosis*, tuberculin; Streptococci.
HYPODERMA. See Oestridae, warbles.
HYPOMAGNESAEMIA. See Grass tetany.
HYPOPHYSIS. See Pituitary gland.

I

ICELAND. See Clostridium infection, in sheep; Helminth parasites, sheep parasites.
ICTEROHAEMOGLOBINURIA. In Brazilian sheep, **418**.
See also Jaundice; Spirochaeta infection.
IMMUNITY.
General, 25; nature of acquired immunity, **77**; role of the nervous system, **287**, **617**; immunity arising from "latent infections", **286**; specific immunity response and the healing of infectious diseases, **479**; value of methods used in veterinary medicine, **542**; local immunity, **562**; local immunity and vaccination by the tracheal route, **188**; reaction of the lungs in subcutaneous immunization, **26**; serologic specificity of lung tissue, **619**; immunological responses of tissues cultivated *in vitro*, **620**; influence of vitamins, **620**; cholesterol and immunity, **25**.
See also Age; Agglutinogens; Allergy; Anaphylaxis; Antibodies; Antigens; Antisera; Blood, serum; complement fixation; Inflammation; Respiratory system; Reticulo-endothelial system; Sensitization; Tests; Vaccines, and also under specific diseases.
Bacterial diseases. Resistance of mouse lines to infection, **237** beta bacteriolysins and immunity to bacteria influenced by them, **25**.
See also under names of specific diseases.
To Fungi. Character of acquired immunity, **323**.
Inherited. Active immunity of the embryo, **287**; origin of humoral immunity of the new born foal, **619**; resistance of the Berkjala breed of swine to hog cholera, **603**.
Metazoan, 433.
To protozoa. See Protozoa, general, and under names of specific diseases.
To viruses. Production of antisera in chickens by inoculation with potato X virus, **619**.
See also under names of specific viruses.
IMMUNIZATION. Local immunity and vaccination by the tracheal route, **188**; associated vaccinations, **188**; triple associated vaccination against diphtheria, tetanus and typhoid-paratyphoid, **188**; antiplague vaccination with living organisms, **617**.
See also *Cysticercus*; Reticulo-endothelial system; Vaccines and also under specific diseases.
IMPOTENCE. See Sex hormones; Sterility.

INCLUSION BODIES. In the leucocytes of fowls in Egypt, **171**.
See also under specific virus.
INDIA. See *Amphistomum* ; Blowflies and flesh flies ; Helminth parasites, goat parasites, sheep parasites ; "Kumri" ; Leishmania infection ; Nematodes, general ; Newcastle disease ; Nutrition ; Pox diseases, in fowls, in goats ; Reports, India ; Rinderpest, control ; Theileria infection ; *Trypanosoma evansi* infection [surra] ; Trypanosoma infection, in cattle.
INDOCHINA. See *Setaria*.
INFECTION, NUTRITION IN RELATION TO RESISTANCE TO. Parasite reactions to host modifications, **415** ; effect of hunger on the development of tuberculosis in g. pigs, **207** ; effect of the plane of nutrition on the course of animal trypanosomiasis, **586**.
INFECTION, RESISTANCE TO. Effect of mucin on infections by bacteria, **64**.
See also Immunity ; Tissue respiration.
INFECTIOUS BULBAR PARALYSIS. See Aujeszky's disease.
INFLAMMATION. Nature of, **340** ; mechanism of increased capillary permeability, **340** ; in resistance to infection, **340** ; alteration in the bactericidal power of the blood in the presence of inflammation, **619**.
INFLUENZA.
General. Differentiation of influenza bacilli from pasteurella, **411** ; complement-fixation reaction, **226** ; transmission to hedgehogs, **378**.
See also Centrifugation.
Equine. Classification, **223** ; periodic ophthalmia after influenza, **239**.
In man. From the ferret, **472** ; neutralizing antibodies for virus in the sera of persons with various histories of influenza, **226**.
See also Influenza, swine.
In mice. Bacterial infection, "*Bacterium influenzae murium*", **317**.
Swine, 18, 130 ; in the U.S.A., **530**; pathology, epidemiology and control, **278** ; immunization experiments with virus, **472** ; susceptibility of swine to the virus of human influenza, **226** ; swineherd's disease, and human and porcine influenza, **528**.
See also Influenza, general.
INHERITED DISEASES. See Diseases, inherited.
INSECT TRAPS. Mechanical insect traps, **182**.
INSECTS, GENERAL. See Arthropods ; Invertebrate vectors of disease.
INSEMINATION, ARTIFICIAL. The semen of stallions in the U.S.S.R., **88**.
INSPECTION OF FOOD. See Food Inspection. meat ; Milk.
INSTITUTES. See Colleges ; Research institutes.
INSULIN. See Myoglobinuria.
INTERNAL SECRETIONS. See Endocrine system.
INTESTINES. The intestinal flora and its role in the life of man and the higher animals, **462**.
See also Colic ; Enteritis ; Entero-hepatitis ; Helminth parasites ; Laryngo-enteritis, infectious ; Salmonella infection.
INTRADERMAL TEST. See Brucella infection, diagnoiss ; *Mycobacterium tuberculosis* infection, diagnosis, tuberculin test ; *Pfeifferella mallei* infection [glanders] ; Swine fever, diagnosis.
INVERTEBRATE VECTORS OF DISEASE. Our present knowledge of the association of insects with disease, **121** ; vectors of protozoan parasites in Russia, **164**.
See also Anaemia, equine infectious ; Anaplasma infection, general ; Ants ; Arthropods ; Babesia infection ; *Glossina* ; Lice ; Mosquitoes ; Pox, in fowls ; *Stomoxys* ; Ticks.
IODINE. Influence on animals, **32** ; survey of New Zealand sheep, **43, 143**.
See also Goitre.
IRAN. Livestock diseases, **80**.
IRIDO-CYCLITIS. See Eyes, diseases.
IRISH FREE STATE. See Milk, hygiene.
IRON. See *Bacillus anthracis*, differentiation ; Bush sickness.
IRRADIATION. See Fowl plague ; Ultra-violet rays.
ITALIAN EAST AFRICA. Livestock diseases, **394**.
See also *Glossina*.
ITALY. See Babesia infection ; Brucella infection ; Clostridium infection, in sheep ; Filariae ; Foot and mouth disease ; Italian East Africa ; Leishmania infection ; Milk, hygiene ; *Mycobacterium tuberculosis* infection, immunization (BCG) ; Reports, Italy.
IXODES. See Ticks.

J

"JAAGZIEKTE". See Respiratory system, diseases.
JAMAICA. See Reports, Jamaica.
JAPAN. See Education.
JAUNDICE. Spirochaetal jaundice of cattle, in Russia, **419**.
See also Leptospira infection.
JAVA. See Dutch East Indies.
JOHNE'S DISEASE. See *Mycobacterium paratuberculosis* infection [Johne's disease].
JOINTS. See Arthritis.

K

KALA AZAR. See Leishmania infection.
KETOSIS. Pathogenesis of ketosis, **485** ; physiological aspects in cows and ewes, **241**.
KIDNEYS.
General. Abnormal pigmentation in the kidneys and adrenal glands of cattle, **347** ; compensatory renal hypertrophy, **400**.
Diseases. Nephrosis, **630** ; amyloidosis in cattle, **129** ; spotted kidneys in calves, **546**.
See also Clostridium infection, in sheep ; Diabetes ; *Dioctophyme* ; Pyelonephritis.
KIDNEY WORM OF SWINE. See *Stephanurus*.
KIKUTH'S CANARY DISEASE. See Pox, in fowls.
KINKY TAIL. See Bones, diseases.
"KUMRI", 623.
KURLOFF BODIES. See *Trypanosoma annamense*.

L

LABORATORIES. See Research institutes.
LACTATION. Effect of udder irrigation and milking interval on milk secretion, **85**.
See also Milk ; Milk fever ; Pituitary gland ; Udder.
LACTATION TETANY. See Tetany.
LAMB DYSENTERY. See Clostridium infection, in sheep.
LAMBS. Paralytic diseases and haemorrhagic septicaemia in lambs, **481** ; diseases in Colorado, **548**.
See also Bacteria general, general ; Brucella infection, in sheep ; Clostridium infection, in sheep ; Copper ; Helminth Parasites, sheep parasites ; Poisoning, plant poisoning ; Skin ; Stomatitis, contagious pustular ; Tick-borne diseases.
LANOLINE. See Antigens, in fatty or oily bases.
LARYNGO-ENTERITIS, INFECTIOUS. In cats, **345**.
LARYNGOTRACHEITIS, AVIAN, 22 ; laryngotracheo-bronchitis in Spain, **531** ; growth of virus on egg embryo, **526** ; ultrafiltration experiments with the virus, **380**.
See also Bronchitis infectious, avian ; Fowls, virus diseases.
"LATENT INFECTIONS". Nomenclature, **286**.
LAW. Principles of sanitary legislation, **304**.
See also Carcasses, animal, destruction of.
Belgium. Decree on control of bovine tuberculosis, **4**.
Denmark. Laws on livestock trade and on its veterinary aspect, **495**.
France. Prophylaxis of tuberculosis in cattle, **3**.
Germany. Reich veterinary ordinance of April, 1936, **39** ; national animal breeding law of March 1936, **39** ; laws regarding heat treatment of milk, **489** ; obligation of silence imposed on veterinary practitioners in the new veterinary order, **496**.
Great Britain. Milk (Special Designations) order, 1936, **486, 487** ; Warble Fly (Dressing of Cattle) order of 1936, **303** ; licensing of stallions under the Horse Breeding Act 1918, report for 1936, **435**.
International conventions, 304.
New Zealand. Stock (Johne's Disease) Regulations, 1936, **107**.
Northern Ireland. Destruction of warble fly maggots in cattle, **303**.
Norway. Order on infectious fowl paralysis, **243**.
Turkey. Order of Ministry of Hygiene on Grades and Standards for Milk, Byres and Dairies, **437**.
United States of America. See Committees.
"LEG WEAKNESS". See Perosis.
LEISHMANIA INFECTION. Canine infection in Athens, **66** ; canine infection in Beirut, **66** ; canine infection in China, **417** ; canine infection in Russia, **463**; parasitism of the lung in generalized infection of the dog, **417** ; diagnosis of canine infection by lymph node puncture, **417** ; treatment by antimony compounds, **352** ; canine visceral infection with reference to human visceral infection, **588** ; cutaneous equine infection, **96** ; leishmaniasis in Portugal, **66** ; in Morocco, **66** ; in India, **588** ; epidemiology of kala-azar, **588**.
LENTIN. In veterinary medicine, **639** ; uterine contractions caused by, **37** ; response of the isolated equine uterus to lentin and pituitary extracts, **552, 639**.
LEPTOSPIRA INFECTION. In dogs, **68** ; serological tests for spirochaeta in Stuttgart disease, **171** ; leptospira in dogs and cats not affected with Stuttgart disease, **419** ; infection experiments with leptospira in dogs and cats, **468** ; human infection with *L. canicola*, **593**.
See also Stuttgart disease.

LETHAL FACTORS, HEREDITARY. Hereditary lethal for localised motor and preganglionic neurones with a resulting paralysis in the dog, **627**.
See also Diseases, inherited.
LEUCAEMIA. See Leucosis.
LEUCOCYTES. See Blood, corpuscles [white], picture.
LEUCOCYTOZOA. Leucocytozoa of fowls in India, **171**.
LEUCOSIS.
General. Mammalian leucoses, **30**.
Avian. Transmission studies in leucaemia, **118** ; haemocytoblastosis and its relation to the development of fowl paralysis and fowl leucaemia, **294** ; fowl paralysis and its relation to leucaemia, **294** ; lymphomatosis in relation to fowl paralysis, **294** ; erythromyelosis and its treatment with liver extracts, **333** ; pH of leucotic fowls and the filtrability of the leucosis agent, **333** ; productio of specific antibodies, **333**.
See also Fowl paralysis ; Neoplasms.
Bovine. In Saxony, **30** ; clinical picture, **378** ; of the testes in a bull, **128** .
LEVANT. See Leishmania infection ; Reports, Levant.
LICE. *Trichodectes subrostratus* in cats, **230** ; the pig louse *Haematopinus suis* as a carrier of *Erysipelothrix rhusiopathiae*, **121**.
LIMONITE. See Cobalt.
LINGUATULA. *L. serrata* in Australia, **122**.
LINSEED. See Poisoning, organic.
LIPOIDS. See *Mycobacterium tuberculosis*, chemical composition.
LIPONYSSUS. See Mange.
LISTERELLA. See Circling disease.
LIVER.
General. Presence of copper in lamb's livers, **447** ; regeneration of the livers of birds, **645** ; cellular changes in the livers of mice affected with fowl plague virus, **178** ; vaso-dilatory reflexes and liver dysfunctions in pathogenesis of milk fever and equine myohaemoglobinuria, **241**.
See also Bile.
Diseases. Cirrhosis of the liver in domestic animals, **347** ; capillary ectasis of the liver in large domestic animals, **128** ; necrotic mastitis and miliary hepatitis in cattle, **509**.
See also *Dioctophyme*.
Therapy. See Leucosis, avian.
LIVER FLUKES. Revelation of the life-history of the liver fluke as an illustration of the process of scientific discovery, **473** ; bone marrow changes in liver fluke disease in sheep, **474**.
See also *Dicrocoelium* ; *Fasciola*.
LIVESTOCK DISEASES. See under name of country.
LIVESTOCK POPULATIONS. In New Zealand in 1936, **89** ; in Palestine, **435**.
See also Reports.
LOCUSTS. See Poisoning.
LOUPING ILL. Effect of louping ill virus on the developing egg, **377** ; sarcocystis present in the central nervous system of the sheep with the virus of louping ill, **328** ; growth of virus on egg embryo, **526** ; in the horse, **470**.
LUCILIA. See Blowflies and fleshflies.
LUNGS. Congenital lung anomalies in animals, **395**.
See also Leishmania infection ; Respiratory system.
LUNG WORMS. Infestations of animals and treatment, **337** ; ingestion of the inflammatory exudate by swine lungworms, **337** ; in goats in Norway, **24**.
See also *Choerostrongylus* ; Helminth parasites ; *Metastrongylus* ; Nematodes ; *Strongylus*.
LYMPH NODES. See Lymphatic system.
LYMPHADENITIS. Skin test for detecting group C haemolytic streptococcal infection causing epizootic lymphadenitis in g. pigs, **542**.
See also Pneumo-lymphadenitis.
LYMPHADENITIS, CASEOUS. See *Corynebacterium pseudotuberculosis* infection.
LYMPHADENOSIS. See Lymphatic system, diseases.
LYMPHANGITIS. See Lymphatic system, diseases.
LYMPHANGITIS, EPIZOOTIC. See *Cryptococcus farciminosus* infection.
LYMPHATIC SYSTEM.
General. Topography of the lymphatic system in swine, **196**.
Diseases. Lymphangitis in horses, **623** ; pneumatosis of lymph nodes in the horse, **622** ; diagnosis of leishmaniasis by lymph node puncture, **417**.
See also *Corynebacterium pseudotuberculosis* infection ; *Cryptococcus farciminosis* infection [epizootic lymphangitis] ; Leucosis, bovine ; Pneumo-lymphadenitis.
LYMPHOMATOSIS. In relation to fowl paralysis, **294**.
LYSIS. See Bacteriophage ; Haemolysis.
LYSOZYME, 493.
See also Bacteriophage.

M

"MAD ITCH". See Aujeszky's Disease.
MAGNESIUM. Blood magnesium of cattle, sheep and swine in health and disease, **493** ; distribution in the animal organism and the effect of dietary magnesium, **398** ; importance in Ca/Mg therapy of milk fever, **638** ; studies on the magnesium content of cows in lactation tetany districts, **241** ; vitamin D sparing action in the ration of dairy cattle, **252** ; grass tetany and magnesium metabolism, **398**.
See also Grass Tetany.
MALARIA. See Plasmodium infection ; Technique general.
MALFORMATION. See Teratology.
MALLEIN TEST. See *Pfeifferella mallei* infection [glanders].
MALTA. See Brucella infection, in man [undulant fever] ; Reports, Malta.
MAMMARY GLAND. Endocrine control, **197**.
See also Milk fever ; Udder.
MAMMITIS. See Mastitis.
MAN, DISEASES OF ANIMALS TRANSMISSIBLE TO AND FROM.
General. See Milk, diseases transmitted by.
Bacterial diseases. Infection with *Bact. abortus-equi*, **318** ; human glanders in the Philippines, **57**.
See also *Bacillus anthracis* infection ; Brucella infection ; Enteritis ; Milk, diseases transmitted by ; *Mycobacterium tuberculosis* infection ; *Salmonella typhi-murium*.
Fungous diseases. Epidemic of trichophytosis spread by a cat, **162**.
Helminth parasites. See *Cysticercus* ; *Diphyllobothrium* ; *Echinococcus* ; Schistosoma infection ; *Taenia*.
Protozoan diseases. Human infection with *Leptospira canicola*, **593**.
See also Leishmania infection ; Spirochaeta infection ; Trypanosoma infection.
Virus diseases. Diseases of animals communicable to man, **69** ; transmission of poliomyelitis by animals, **529**.
See also Foot and mouth disease ; Influenza ; Psittacosis ; Swineherd's disease.
MANGE. Sheep scab and goat mange, **535** ; life-history of *Psoroptes communis* var. *ovis* with reference to latent or suppressed scab, **122** ; control of sheep scab in a Red Indian community, **123** ; treatment of goat mange with derris, **300** ; sulfocyanate treatment in g. pigs, **36** ; use of chloropicrin, **639** ; *Demodex folliculorum* (*canis*), its diagnosis and treatment, **335** ; method for the preparation of mange mites for microscopical examination, **494** ; northern fowl mite *Liponyssus sylvarium* and its control, **123**.
MASTITIS, CAPRINE, 153.
MASTITIS, BOVINE.
General, 238 ; characteristics of mastitis streptococci, **2** ; staphylococcic mastitis, **35**, **508** ; necrotic mastitis and milary hepatitis in cattle, **509** ; bovine mastitis and human infection, **632**.
See also Brucella infection ; *Corynebacterium pyogenes* infection ; *Mycobacterium tuberculosis* infection, in milk ; *Staphylococcus* ; *Streptococcus*, cultivation.
Control. In Switzerland, **291** ; in New York State dairy herds, **311** ; by segregation, **311** ; value of milker's ointments, **244**.
Diagnosis. Practical methods of testing for mastitis, **311** ; detection of shedders of streptococci, **312** ; demonstration of pus and mastitis streptococci in raw and heated milk, **244** ; identification of streptococci in routine milk samples, **565**.
See also Milk, bacterial content.
Treatment. New remedies for streptococcal infection, **354** ; lanolin vaccines, **312** ; attempts to cure mastitis with ozone, **354** ; by udder infusions with "Zysternal", **354**.
MASTITIS, OVINE. See Clostridium infection, in sheep.
MATERIA MEDICA. See Therapeutics.
MAURITIUS. See Trypanosoma infection.
MEAT INSPECTION. See Food inspection, meat.
MEAT POISONING. See Food poisoning, meat.
MEDIA. Growth-promoting and growth-inhibiting substances present in brilliant-green bile medium, **448**.
See also Bacteria general, cultivation, differentiation ; *Erysipelothrix rhusiopathiae* ; Milk, bacterial content ; *Mycobacterium tuberculosis*, infection, tuberculin, cultivation ; Protozoa general ; Viruses.
MENINGITIS. In a dog caused by an actinomyces, **323** ; spinal meningitis in an ox caused by a warble fly larva, **76**.
MERCURIC CHLORIDE. See Anaemia equine infectious, diagnosis.
MERTHIOLATE. See Disinfectants.
MESCALBEAN. See Poisoning, plant poisoning.

METABOLISM.
General. Mineral metabolism and the suprarenal gland, **251**; mineral metabolism in the calf and the addition of inorganic minerals to the diet, **296**; mineral balance in animals drinking saline and alkaline waters, **296**; regulating mechanism, **553**.
See also Blood, chemical composition; Bones, composition; Calcium; Carbohydrates; Copper; Fats; Iodine; Iron; Magnesium; Phosphorus; Nutrition; Sulphur; Vitamins.
Diseases. Calcium-phosphorus metabolism in normal and sick cattle, **631**.
See also Acidosis; Bush sickness; Goitre; Ketosis; Milk fever; Reticulo-endothelial system; Rickets.
METASTRONGYLIDAE. See *Angiostrongylus*; Crenosoma infection; *Metastrongylus*; *Oslerus*.
METASTRONGYLUS. Histology in swine, **124**; biology of *M. elongatus*, **337**.
METHYLENE BLUE REDUCTION TEST. See Milk, bacterial content.
METORCHIS. *M. albidus* a dog fluke new to North America, **610**.
MICE. See *Bacillus anthracis* infection, immunization; Catarrh; Encephalomyelitis; Fowl plague; Salivary gland virus; Trypanosoma infection, in wild animals and birds.
MICROCOCCI. Resistance to pasteurization, **490**.
MICROFILARIAE. See *Filariae*.
MICROSCOPY. Animal micrology, exercises in zoological microtechnique, **408**; microscopical method of distinguishing dead from living bacterial cells, **253**.
MIDGES. See *Simulium*.
MILK.
General. See Lactation; Nutrition; Poisoning.
Bacterial content. Bacterial examination in Poland, **351**; bacterial contents of raw and pasteurized milk, **35**; counts of raw and pasteurized milk, **84**; tests of commercial stassanized milk, **350**; comparative values of the plate count and modified methylene blue reduction test as routine methods for grading milk, **488**; statistical examination of the significance and comparative value of milk agar for raw and pasteurized milk, **490**; demonstration of pus and mastitis streptococci in raw and heated milk, **244**; identification of mastitis streptococci in routine milk samples, **565**; relationship of pig farming to the occurrence of souring streptococci in milk and milk products, **438**; resistance to staining acquired by bacteria through heating in milk, **490**; heat resistance of a thermoduric streptococcus grown at different temperatures, **490**.
See also Brucella infection, in milk; Mastitis, bovine, diagnosis; Milk, pasteurization; *Mycobacterium tuberculosis* infection, in milk; *Streptococcus*.
Cell content. Eosinophile leucocytes, **244**; significance of microscopically demonstrable pus in milk, **549**.
Chemical composition. See Tetany.
Control. See Milk, hygiene.
Diseases transmitted by. Staphylococcic mastitis, transmission to man, **35**; human infections, **632**, **634**; epidemics due to raw milk in Canada, **490**; incidence and significance of beta haemolytic streptococci in cultures from a selected group of milk handlers, **313**.
See also Brucella infection; Food poisoning, milk; Mastitis, bovine; *Mycobacterium tuberculosis* infection, milk; *Streptococcus*.
Hygiene. In Great Britain, **488**; in the Irish Free State, **194**; in Australia, **34**; in New Zealand, **194**; in Canada, **194**; in France, **488**; in Italy, **33**; in the U.S.A., **33**, **439**, **489**; hygienic control of raw milk, **633**; veterinary service in the control of milk products, **89**; Milk (Special Designations) Order, 1936, Great Britain, **193**, **486**, **487**; tubercle-free herds, present position and policy, **350**; consideration of the accredited producers' scheme of the Milk Marketing Board, **350**; administration of the attested herd scheme and the Milk (Special Designations) Order of 1936, **350**; tuberculin tested milk, reorganization for production, **407**; quality of the milk supplied to school children, **488**.
See also Law, Turkey; Milk, bacterial content; Milker's ointments.
Milk products, 407.
See also Milk, bacterial content.
Nutritive value, 644; relative value of raw and heated milk, **252**; nutritive value of raw and pasteurized milk for calves, **643**.
Pasteurization. Resistance of micrococci to pasteurization, **490**; studies in the bacteriology of low temperature pasteurization, **490**; control of the efficiency of pasteurization in milk, phosphatase test, **490**; survey of pasteurization in Canada, **490**; laws regarding heat treatment of milk in Germany, **489**; milk control and pasteurization in Germany, **33**.
See also Milk, bacterial content, nutritive value.
Therapy. Use of acidophilus milk in the treatment of dysentery of young animals, **551**.
Verification of animal of origin. Differentiation of cows' milk from sheep and goat milk by the Schern-Gorli ring test, **550**.
MILK FEVER. Milk fever and allied conditions, **241**, **547**; new theory on the cause, **349**; importance of magnesium in Ca/Mg therapy, **638**; vaso-dilatory reflexes and liver dysfunctions in pathogenesis of milk fever, **241**; treatment with "Calcimagon", **638**.
See also Ketosis; Tetany.
MILKER'S OINTMENTS. Value for preventing the spread of mastitis, **244**.
MINERAL DEFICIENCIES. See Nutritional diseases; Trypanosoma infection, in sheep.
MINERAL METABOLISM. See Metabolism; Trypanosoma infection, in cattle.
MINK. Care, handling and common diseases, **483**.
MITES. Formosan chicken mite *Neoschongastia gallinarum* (Hatori 1920), **607**; attempts to transmit fowl spirochaetosis by *Dermanyssus gallinae*, **607**; method for the preparation of mange mites for microscopical examination.
See also Mange; Pox, in fowls; *Toxoplasma*.
MONIEZIA. Attachment of the sheep hookworm *Bunostomum trigonocephalum* to *Moniezia*, **611**.
MONKEYS. See Trypanosoma infection, in wild animals and birds.
MONOCYTES. See Blood, corpuscles [white].
MONSTERS. See Teratology.
MOON BLINDNESS. See Ophthalmia, periodic.
MOOSE. Diseases, **482**.
MOROCCO. See Babesia infection, treatment; Leishmania infection; Reports, Morocco; Theileria infection.
MOSQUITOES. *Culex* a new vector of *Spirochaeta gallinarum*, **69**; transmission of rabbit myxomatosis by *C. quinquefaciatus*, **427**; transmission of equine encephalomyelitis, **175**.
See also Pox, in fowls.
MUCIN. Effect on infections by bacteria, **64**.
MUSCLES. Chemistry of muscular contraction, **553**.
See also Slaughter.
Diseases. Congenital quadriplegic contractions in animals, **30**.
See also Trembling disease.
MYCOBACTERIUM, GENERAL. New acid fast bacillus found in g. pigs, **107**; unusual acid-fast organisms isolated from human sources, **107**; cultural characters of tubercle bacilli and acid-fast saprophytes, **316**; staining of leprosy and tubercle bacilli, **401**; fate of phagocytozed acid fast bacteria as determined by the single cell method, **157**.
M. PARATUBERCULOSIS INFECTION [JOHNE'S DISEASE] 208, **316**; in Australia, **366**; in Holland, **55**; stock regulations New Zealand, 1936, **107**; diagnosis with johnin, **572**; increase of allergy in g. pig by inoculations of killed cultures of *Mycobacterium paratuberculosis* embedded in vaseline, **475**.
M. TUBERCULOSIS.
General. Methods of multiplication of bacilli, **157**; cytology of the bacillus, **157**.
See also *Mycobacterium tuberculosis* infection.
Chemical Composition. Chemistry of the lipids of bacilli, **56**.
See also *Mycobacterium tuberculosis*, tuberculin.
Cultivation. Cultivation and isolation, **104**; from faeces, **362**; from spotted kidneys in calves, **321**; from the lung mucus of tuberculous cattle, **455**; inexpensive synthetic medium, **104**; comparison of media for the isolation of *Mycobacterium tuberculosis*, **572**; BCG culture, **155**.
See also *Mycobacterium*, general; *M. tuberculosis*, tuberculin; *M. tuberculosis*, infection, in cattle.
Dissociation, 55; of bovine type bacilli, **261**; methylene blue reduction of the R and S varieties, **261**; variation and dissociation of the avian type bacilli, **6**; allergic reactions in g. pigs inoculated with "R" and "S" variants of dead avian bacilli, **233**.
See also *M. tuberculosis* infection, avian type infection, bovine type infection, premunition.
Metabolism. Glycerol and carbohydrate utilization, **514**; pH curve of mammalian and avian strains, **157**.
Tuberculin. Production, **104**; new culture medium for preparation, **126**; physico-chemical nature, **388**; standardization, **126**, **388**; purification by phosphotungstic acid, **613**.
See also *M. tuberculosis*, cultivation; *M. tuberculosis* infection, tuberculin test.
Types. Typing by culture, **54**; by intracerebral inoculation of rabbits, **571**.
See also *M. tuberculosis* infection, in swine.
Vaccines. See *M. tuberculosis* infection, immunization.

M. TUBERCULOSIS [contd].
Viability. Effect of age on cultures of the bovine type, **104**; persistence of avian type in soil, **6**; infectivity for healthy calves of bovine bacilli discharged in dung upon pasture, **361**; inhibitory action of colloidal sulphur in Corper's agar on four strains of *M.t. hominis*, **104**; influence of hot hypochlorites of low alkalinity, **196**; influence of the ethereal oils, **104**; influence of inorganic reducing substances, **364**.
See also *Mycobacterium*, general; *M. tuberculosis* infection, avian type infection.
Virulence. Pathogenicity of strains of bacilli for the rabbit inoculated into the anterior chamber of the eye, **569**; loss of virulence and stability of an avian bacillus after five years' cultivation on glycerinated potato, **571**; loss of virulence of a dysgonic culture of bovine bacilli, **571**.
M. TUBERCULOSIS INFECTION.
General, 238; in Uganda, **498**; naturally acquired infection, **52**; statistical interpretation of data in experimental infection, **409**; intestinal infection in g. pigs, **55**; effect of hunger on the development of infection, **207**; remote toxic action of tubercle bacilli enclosed in collodion sacs in the peritoneum of the rabbit, **235**; experimental osseous and osteo-articular tuberculosis in the rabbit, **260**; behaviour of bacilli within the body, **363**; influence of female sex hormones and castration on development of experimental infection, **234**; effects of adding various substances to suspensions of tubercle bacilli in experimental infections, **364**; standardization of longevity against dose in experimental tuberculosis by intracerebral inoculation, **364**; effect of drugs on sensitiveness of animals to anaphylaxis and tuberculosis, **431**; interplay of the haemopoietic tissues in rabbits infected experimentally, **569**; vitamin D in experimental infection of g. pigs, **569**; routes of dispersion of bacilli administered *per os*, **569**; haematology of the rabbit in infection of the Yersin type, **55**.
See also *M. tuberculosis*; Books, text-books.
Allergy. Non-specific tuberculous allergy, **614**; allergy and anaphylaxis, **233**; heteroallergy in tuberculosis, tissue reaction of tuberculous animals to pathogenic microorganisms, **233**; anaphylaxis, tuberculosis and the sympathetic nervous system, **233**; attempt to desensitize tuberculous g. pigs with dead vaccine and products of the bacillus, **5**; allergic reactions in g. pigs inoculated with "R" and "S" strains of dead avian bacilli, **233**.
See also *M. tuberculosis* infection, immunity, tuberculin test.
Avian type infection, 156; in rabbits, **55**; in fowls and rabbits, **156**; in cattle, **104**; recoverability from experimentally infected g. pigs, **156**.
See also *M. tuberculosis*, dissociation, viability, virulence; *M. tuberculosis* infection, allergy, in cattle, in fowls, in man from animals.
Bacillaemia. In immunized and non-immunized rabbits, **156**.
BCG, Pathogenicity of. The Lübeck tuberculosis disaster (infants), official enquiry, **105**.
Bovine type infection. See *M. tuberculosis*, viability, virulence; *M. tuberculosis* infection, in cattle, in fowls, in man from animals, tuberculin test.
Brucella infection in relation to. Experimental simultaneous brucella infection and tuberculosis, **344**.
In cats. Experimental skin infection, **315**.
In cattle. In North Wales, **51**; in Germany, **51**, **513**; in South Africa, **259**; in the Sudan, **501**; human type infection, **104**, **207**; pulmonary infection, **2**; blood picture, **3**; fat content of body organs, **4**; genital infection, **51**; eradication in Scotland, **3**.
See also *M. tuberculosis* infection, avian type infection, control, diagnosis, immunization [BCG], methods of infection, tuberculin test.
Control, 457; in Belgium, **4**; in Denmark, **103**; in France, **402**, **434**; France—law on the prophylaxis of tuberculosis in cattle, **3**; in Germany, **434**, **456**; in Switzerland, **291**; in the U.S.A., **315**, **511**; in the Dutch East Indies, **513**.
See also Milk, hygiene; *M. tuberculosis* infection in cattle, methods of infection, in milk.
Diabetes in relation to. In dogs, **364**.
Diagnosis, 457; of lung infection in cattle by intercostal percussion, **456**; clinical diagnosis, **512**; dark field illumination, **39**; comparative study of culture and animal inoculation for isolating bacilli from pathological materials, **261**; cultural diagnosis, **457**, **570**; removal of uterine mucus for examination, **455**; in milk by cultural method, **362**, **634**; rapid detection in milk, **633**; by the complement-fixation reaction, **339**; meat inspection in relation to, **492**.
See also *M. tuberculosis* infection, tuberculin test.
In dogs, 154.
See also *M. tuberculosis* infection, diabetes in relation to.
Excretion of infective agent. Infectivity of bacilli discharged in dung, **361**; routes of excretion in rabbits and g. pigs, **569**.
Exotuberculin. See *M. tuberculosis* infection, tuberculin test [exotuberculin].
In Fowls. In Portugal, **458**; effect of feeding bovine tuberculous organs, **52**; cellular elements and haemoglobin in the blood of chickens with spontaneous infection, **156**.
See also *M. tuberculosis* infection, tuberculin test.
Heredity, 54; in g. pigs, **569**.
In horses. In an army horse, **52**; ringbone in a horse probably associated with tuberculosis, **260**; experimental study of equine infection, **409**.
Human type infection. The Lübeck tuberculosis disaster, official enquiry, **105**.
See also *M. tuberculosis* infection, in cattle, immunization, in man; tuberculin test.
Immunity. Tuberculous antibodies in the g. pig, **127**; lipoprotein antibodies, **235**; hypersensitiveness and antibody formation in tuberculous rabbits, **390**; acquired resistance to infection, **514**; role of the reticulo-endothelial system in active immunity, **572**; helminthiases and tuberculosis, **434**.
See also *M. tuberculosis*, tuberculin.
Immunization, 344; experiments with AO vaccine, **25**; of g. pigs with heat-killed and formol-killed bacilli, **5**; inoculations of g. pigs with living bacilli in lanoline or tapioca, **234**; resistance conferred on the monkey by inoculation of an "S" strain of the human type isolated by blood culture, **260**; immunity in calves by the subcut. inoculation of *M. tuberculosis* antigens in oily excipients, **155**; Northern Ireland experiments with the Spahlinger vaccine, **208**; non-specific increase of resistance after vaccination with staphylococci, **316**; with different types of bacilli and with staphylococci, **316**; Friedmann's vaccine against human and animal infection, **5**.
See also *M. tuberculosis*, infection, bacillaemia.
Immunization [BCG]. Immunizing properties, **316**; experiments with, **106**; duration of immunity conferred, **155**; role in the vaccination of cattle, **410**; of cattle in Italy, **365**; failures in calves, **366**; antibody production by a heifer vaccinated with BCG, **410**; lesions produced in the organs of the rabbit by single and repeated intravenous injections, **571**; vaccination and treatment of g. pigs, **155**.
In man [bovine type infection], 315, **316**, **410**, **458**; in Holland, **572**; control, **562**.
See also *M. tuberculosis* infection, tuberculin test.
In man [avian type infection], 6, **261**.
Meat inspection. See *M. tuberculosis* infection, diagnosis.
Methods of infection, 457; in young calves, **510**.
In milk. Incidence of infection in Madrid, **84**; presence of tubercle bacilli in milk, butter, and cheese, **549**; demonstration of infection of the udder by the cell content of milk, **4**, **633**; demonstration by cultural method, **362**, **634**; routine tests for bacilli, **362**.
See also *M. tuberculosis* infection, diagnosis.
Premunition. Premunition of the g. pig, rabbit and monkey with smooth strains of bacilli, **260**; value of smooth bacilli, **260**.
In swine, 315; in the U.S.A., **5**; in Eastern Norway, **54**; in the Federated Malay States, **54**; bacillary types in Denmark, **410**; of the liver, **103**; tuberculous pachydermia, **51**.
Treatment. Influence of inorganic reducing substances on experimental tuberculosis, **364**; effects of intravenous injections of lecithin on tuberculosis in the rabbit, **364**.
Tuberculin test. In cattle, **25**, **613**; tuberculin testing of animals imported into Antwerp, **126**; value of different tuberculins, **339**; value of different methods, **388**; comparative tests with human, bovine and avian tuberculins, **475**; intradermal tests, in cattle, **26**, **126**, **286**, **389**, **613**; wattle test, **431**; intradermal test in ducks, **614**; value of the negative subcutaneous test, **25**; influence of tuberculin desensitization upon immunity to infection, **25**; allergy to tuberculin in actinomycosis and brucellosis, **475**; bacterial hypersensitivity, tuberculin sensitive tissues, **390**; in man, **409**.
Tuberculin test [exotuberculin]. Intradermo-palpebral exotuberculin test, **475**; in human and veterinary medicine, **406**.
Tuberculin test [no lesion reactors], 361; in Australia, **389**.
MYCOSIS. See Fungi.
MYELITIS. Enzootic of horses in Czechoslovakia, **293**.
MYIASIS. See Blowflies and fleshflies.
MYOGLOBINURIA PARALYTICA, EQUINE, 82; vasodilatory reflexes and liver dysfunctions, **241**; pathogenesis and treatment, **395**; myoglobin evacuated from muscle fibres, **547** insulin in treatment, **551**.
MYOPORUM DESERTI. See Poisoning, plant poisoning.
MYOSITIS. Nutritional myositis of horses in Poland, **349**.
MYXOMA, INFECTIOUS, OF RABBITS. Relationship between myxoma, neuromyxoma and fibroma virus, **605**; effect of intracerebral passage on the virus, **605**; histology, **605**; immunity as affected by the portal of entry, **180**; transmission of rabbit myxomatosis by *Culex quinquefaciatus*, **427**; susceptibility of rabbits, **118**; experiments with *Myxomatosis cuniculi* (Sanarelli) to ascertain the suitability of the virus to control the rabbit population, **180**
See also Fibroma; Papilloma.

N

NAGANOL. Toleration by horses, **550**.
See also Trypanosoma infection, treatment; *Trypanosoma evansi* infection [surra].

NECROTIC HEPATITIS. See Clostridium infection, immunization.

NEGRI BODIES. See Rabies.

NEMATODES, GENERAL. Introduction to nematology, **660**; simple method of staining and mounting larvae, **647**; fauna of British India, ascaroidea and strongyloidea, **183**; effects of some natural factors on the second ecdysis of nematode larvae, **336**; nematodes from equines in Panama, **336**; bionomics and control of the bursate nematodes of horses and sheep, **284, 539**; distribution in the small intestine of sheep, **474**; cattle infections, secondary transmission to grazing sheep, **284**; control of nematode infestation, **230**.
See also *Acuaria*; *Amidostomum*; *Ancylostoma*; *Angiostrongylus*; Ascarids; *Capillaria*; *Chabertia*; *Dioctophyme*; *Dirofilaria*; *Echinopardalis*; *Eucoleus*; Filariae; *Gnathostoma*; Lungworms; *Metastrongylus*; *Nippostrongylus*; Onchocerca; *Oslerus*; *Oxyspirura*; *Setaria*; *Stephanofilaria*; *Stephanurus*; Stomach worms; *Strongylus*; *Trichinella*; *Trichuris*; *Tropisurus*; *Trichostrongylus*.

NEOPLASMS, GENERAL, 83; in animals, **631**; in poultry, **631**; aetiology, **631**; virus of rabies and neoplastic cells, **74, 600**; effect of ultra-high atmospheric pressure, **583**; experimental cancers, **240**; cancer of the conjunctiva in cattle, **240**; thirty-fourth annual report of the Imperial Cancer Research Fund, 1935-1936, **658**; thirteenth annual report of the British Empire Cancer Campaign, **658**.
See also Carcinoma; Epithelioma; Granuloma; Leucosis, avian; Lymphomatosis; Myxomatosis; Reticulo-endothelial system.

NEPHRITIS. See Kidneys, diseases.

NEPHROSIS. See Kidneys, diseases.

NERVOUS SYSTEM.
General. Growth and change in the neurons of the spinal ganglia according to age in cattle, **446**; experimental and clinical studies of the spine of the dog, **99**; role in immunity, **287, 617**.
Autonomic. Nocifensor system of nerves and its reactions, **445**; anaphylaxis, tuberculosis and the sympathetic nervous system, **233**; vaso-dilatory reflexes in pathogenesis of milk fever and equine myohaemoglobinuria, **241**.
See also Anaphylaxis.
Diseases. Comparative study, **624**; blood brain barrier in infectious diseases of the central nervous system, **81**; capillary ectasis of the liver in large domestic animals due to damage of the spinal nerves, **128**; diseases of the central nervous system in horses, **624**; neuritis caudae equinae, **127**; significance of inclusions in the nerve cells of the brain in equine encephalomyelitis, **424**; pathology of "swayback", **131**; spontaneous avitaminosis in sheep with reference to lesions in the central nervous system, **192**.
See also Aujeszky's disease; Fowl paralysis; Louping ill; Myelitis; Paralysis; Pleuro-pneumonia, of goats; Poliomyelitis; Rabies; Roaring; Trembling disease; Viruses, neurotropic.
Pathological changes. In the central nervous system in encephalomyelitis enzootica suum, **71**; histological changes in the central nervous system in Aujeszky's disease, **424**.

NEURO-LYMPHOMATOSIS. See Fowl paralysis.

NEW BORN ANIMALS. See Calves; Foals.

NEW ZEALAND. Livestock diseases, **41**; deficiency diseases in livestock, **83**.
See also Bush sickness; Circling disease; Clostridium infection, in sheep; *Echinococcus*; Iodine; Law, New Zealand; Milk, hygiene; Poisoning; Photosensitivity; Reports; Rickets.

NEWCASTLE DISEASE. In India, **531**; fowl plague in relation to, **279**; growth of Newcastle disease virus on egg embryo, **526**; relationship between the virus of rinderpest and Newcastle disease, **605**.
See also Fowl plague.

NICOTINE POISONING. See Poisoning, plant poisoning.

NIGHTSHADE. See Poisoning, plant poisoning.

NIPPOSTRONGYLUS. Inter-relations between prenatal and intestinal immunity in rats infected with *Nippostrongylus*, **386**.

NOCIFENSOR SYSTEM. Nocifensor system of nerves and its reactions, **445**.

NOMENCLATURE. "Latent infections", **286**.
See also *Actinomyces*; Babesia infection; Bacteria general; Zoology.

NORTHERN IRELAND. See Law, Northern Ireland; *M. tuberculosis* infection, immunization.

NORTHERN RHODESIA. See Trypanosoma infection, control.

NORWAY. See Brucella infection, control; Colleges; Law, Norway; Lungworms; *M. tuberculosis* infection, in swine; Pasteurella infection, in cattle; Reports, Norway; Trichomonas infection, bovine.

NUTRITION. Relation of animal nutrition to public health in India, **648**; mineral metabolism in the calf and the addition of inorganic minerals to the diet, **296**; vitamin D sparing action of magnesium in the ration of dairy cattle, **252**; distribution of magnesium in the animal organism and the effect of dietary magnesium, **398**; relative value of raw and heated milk in nutrition, **252**; antirachitic value of hay in the ration of dairy cattle, **252**; relative value of farm grains in poultry nutrition, **553**; a factor in enterotoxaemia of lambs, **12**; influence of bowel anastomosis on the general nutritional state of merino sheep, **86**; influence on experimental swine erysipelas, **57**.
See also Breeding; Calcium; Cobalt; Fats; Immunity; Infection, nutrition in relation to resistance to; Metabolism; Milk, nutritive value; Phosphorus; Reports, New Zealand; Vitamins.

NUTRITIONAL DISEASES. Mineral deficiency diseases, **437**; in New Zealand, **83**; mineral deficiencies in livestock due to emergency feeds, **547**; rickets-like disease in young cattle, **191**; influence of solar ultraviolet radiation upon rickets of dairy calves, **252**; investigation of the nutritional and biochemical effects of a low calcium diet on sheep, **83**; effect of phosphorus deficient diets on the metabolism, blood and bones of sheep in Great Britain, **134**; spontaneous avitaminosis in sheep with reference to lesions in the central nervous system, **192**; disease of horses caused by mouldy corn, **623**; influence of dietetics on gastro-intestinal disease of army horses, **293**; nutritional diseases of swine, **548**; inorganic phosphorus and perosis, **133**; influence of diet on caries in children's teeth, **243**.
See also Anaemia; Avitaminosis; Bush sickness; Clostridium infection; Diarrhoea; Encephalomalacia; Haematuria; Icterohaemoglobinuria; Metabolism, diseases; Milk fever; Myositis; Nutrition; Pica; Pining; Poisoning; Rickets; Rheumatism; Skeletal disease; Sterility; Tetany; Vitamins.

NUTTALLIA. See Babesia infection.

NYASALAND. See Reports, Nyasaland.

NYMPHOMANIA. Aetiology, **630**.

O

OAK. See Poisoning, plant poisoning.

OAT HAY. See Poisoning, plant poisoning.

OESOPHAGOSTOMUM. Effect of ferrous sulphate and copper sulphate on experimental infection of pigs with *O. dentatum*, **353**.

OESTRIDAE.
Bots. *Cephalomyia ovis*, infestation in a sheep, **382**; destruction of *Gastrophilus intestinalis* eggs on horses by warm water, **536**.
Warbles. Great Britain, Dressing of Cattle Order of 1936, **303**; ox warble fly in Poland, **382**; spinal meningitis in an ox caused by a larva, **76**; destruction in cattle, **303**; control in Denmark, **121**; a *Hypoderma* larva in a horse, **537**; invasion of the brain of a horse by a *H. bovis* larva, **76**.

OESTRIN. See Sex hormones.

OESTRUS. Oestrus and ovulation in mares, **645**; hormonal induction in sheep, **141**; hormonal prevention in dogs and cats, **141**.
See also Genital system; Sex hormones.

OFFICE INTERNATIONAL DES EPIZOOTIES. Report of the director 1935-1936, **255**.

OMASUM. See Digestive system.

ONCHOCERCA. Biology of infection in man and animals, **541**; in Central America, **231**.

OPHTHALMIA, PERIODIC. See Eyes, diseases.

OPISTHORCHIDAE. See *Clonorchis*; *Metorchis*; *Opisthorchis*; *Pseudamphistomum*.

OPISTHORCHIS. Life history of *O. felineus* in Prussia, **610**.

ORCHESTIA. See *Hymenolepis*.

ORNITHODORUS. See Ticks.

OSLERUS. Parasitic tracheobronchitis in the dog due to *O. oslerli*, **540**.

OSMOSIS. See Digestive system, physiology.

OSTEITIS. See Bones, diseases.

OSTEOMALACIA. In cattle in Poland, **32**.

OSTEOPETROSIS. See Bones, diseases.

OVARY. See Genital system; Granuloma.

OWLS. See Virus diseases, bird viruses.

OX WARBLE FLY. See Oestridae, warbles.

OXIDATION REDUCTION POTENTIAL. Relation to chemotherapeutic action, **637**.

OXYSPIRURA. Verminous conjunctivitis in fowls caused by *O. mansoni*, **612**.

OZONE. See Mastitis bovine, treatment.

P

PALESTINE. See Livestock populations ; Meat inspection ; Pleuro-pneumonia of goats ; Reports, Palestine ; Theileria infection.
P-AMINO-PHENYL SULPHAMIDE. Chemotherapy of streptococcic infections by derivatives, **299**.
PANAMA. See Encephalomyelitis, equine ; Nematodes.
PAPILLOMA. Infectious papilloma of the vulva of a cow, **397** ; immunization of rabbits, **606** ; relation of the virus causing rabbit papillomas to the cancers deriving therefrom, **331** ; serological reactions with a virus causing rabbit papillomas which become cancerous, **180, 380** ; affinity of vaccinia and herpes virus for the epithelial elements of Shope's papilloma, **180**.
See also Myxoma.
PARAGONIMUS. Histopathology in cats in China, **281**.
PARALYSIS. Paralytic diseases in lambs, **481** ; spontaneous paralysis of the hind quarters of rabbits, **132** ; hereditary lethal for localised motor and preganglionic neurones with a resulting paralysis in the dog, **627**.
See also "Kumri" ; Roaring ; Tick paralysis.
PARALYSIS, FOWL. See Fowl paralysis.
PARAPLEGIA. See Myelitis ; Paralysis.
PARASITIC GASTRITIS. See Stomach worms.
PARASITIC INFESTATION, GENERAL. Parasites of animals and public health in North America, **352** ; of animals and man in Hawaii, **428** ; of animals in Queensland and their control, **119** ; of cattle, **119** ; of cattle in Puerto Rico, **230** ; of the horse, **119** ; of the pig, **119** ; of swine in Puerto Rico, **428** ; of sheep, **119** ; control in sheep and goats, in Norway, **384** ; of the dog and cat, **119** ; internal parasites in relation to meat supplies, **352** ; treatment for external parasites, **300**.
See also Arthropod parasites ; Books, reference books ; Entomology ; Helminth parasites ; Protozoa, general ; Repellents.
PARASITICIDES. See Anthelmintics ; Dips ; Mange ; Repellents.
PARATYPHOID. See Salmonella infection.
PASPALUM. See Poisoning, plant poisoning.
PASTEURELLA, GENERAL. Differentiation of influenza bacilli from pasteurella, **411** ; influence of culture media on the isolation of pasteurella from equine cerebral tissues of artificially inoculated horses, **318** ; spontaneous transmutation of *P. pestis* into *P. pseudotuberculosis rodentium*, **577**.
See also Bacteria, general, immunity ; Cornstalk disease.
PASTEURELLA INFECTION [HAEMORRHAGIC SEPTICAEMIA].
General. The cat as carrier of plague, **576** ; association of the virulence of *P. septica* infection, **515**
In cattle. In the U.S.A., **515** ; in Norway, **7** ; pathology of chronic infection in calves, **367**.
In fowls [fowl cholera]. Epidemiology, **208** ; new knowledge, **58** ; in Egypt, **367** ; in the Federated Malay States, **651** ; mechanism of infection and immunization, **367** ; vaccine, **57** ; immunization with *P. aviseptica* treated with malachite green and with brilliant green **7** ; vaccination with formolized vaccines and with *P. a.* cultures killed by aniline dyes, **8**.
Immunization. Vaccination against bubonic plague, **392, 514** ; immunization of animals for production of antisera, **393** ; in Dutch East Indies, **57, 575**.
In swine [swine plague]. Glucoside vaccine, **159**.
In sheep, 481, 575.
Treatment. Value of trypaflavine, **36**.
PAST. AVISEPTICA. See Pasteurella infection, in fowls.
PAST. BOVISEPTICA. See Pasteurella infection, in cattle.
PAST. PSEUDOTUBERCULOSIS. Increase of allergy in g. pigs by inoculations of killed cultures of *P. pseudotuberculosis* embedded in vaseline, **475**.
PAST. SUISEPTICA. See Pasteurella infection, in swine.
PAST. TULARENSIS. See *Bacterium tularense* infection [tularemia].
PASTEURIZATION. See Milk, pasteurization.
PATHOLOGY. Third International Congress for Comparative Pathology, 1936, Reports, **657**.
See also Books, text books ; Inflammation, and under name of disease and organ.
PELLAGRA. See Poisoning, selenium.
PERIODIC OPHTHALMIA. See Eyes, diseases.
PERMEABILITY OF TISSUES. Factor in culture filtrates of certain pathogenic bacteria which increases the permeability of the tissues, **289** ; invasion of the body by animal poisons, **358**.
See also Antibodies ; Cataphoresis ; Inflammation.
PEROSIS. Factors producing and preventing perosis, **192** ; inorganic phosphorus, **133** ; influence of single grains on slipped tendons, **133** ; constituents of wheat grey shorts which prevent slipped tendon, **443**.
PERSIA. See Iran.
PETRAGNANI'S MEDIUM. See Brucella group, differentiation
PFEIFFERELLA MALLEI. Cultivation, **574** ; purification of mallein, chemical analysis of *Pf. mallei* and proteins obtained from its culture, **574** ; increase of allergy in the g. pig by inoculations of killed cultures embedded in vaseline, **475**.
PF. MALLEI INFECTION [GLANDERS]. Blood picture of glandered horses subjected to Panek's provocation test, **158** ; artificial infection of the horse with *B. mallei* isolated from a goat, **316** ; reaction to the mallein test in a horse experimentally infected with glanders, **317** ; intradermo-palpebral mallein test, **389** ; control in the U.S.S.R., **575** ; treatment in horses, **574** ; human glanders in the Philippines, **57**.
PF. WHITMORI INFECTION [MELIOIDOSIS]. The pig as carrier of *Pf. whitmori*, **208**.
PHARMACOLOGY. Practical veterinary pharmacology, materia medica and therapeutics, **505**.
See also Therapeutics.
PHENOLS. See Disinfectants.
PHENYL MERCURIC SUBNITRATE. See Antiseptics.
PHILIPPINE ISLANDS. The establishment and growth of the College of Veterinary Science, **98**.
See also *B. anthracis* infection, general ; *Pfeifferella mallei* infection.
PHORMIA. See Blowflies and fleshflies.
PHOSPHATASE TEST. See Milk, pasteurization.
PHOSPHORUS. Effect of phosphorus deficient diets on the metabolism, blood and bones of sheep in Great Britain, **134** ; partition of calcium and inorganic phosphorus in equine serum, **251** ; variations in inorganic phosphorus and calcium content of the blood of horses, **447** ; phosphorus deficiencies and disease, **135**.
See Abortion ; Bones, general ; Nutritional diseases ; Poisoning, selenium.
PHYSALOPTERA. *Ph. felidis* n. sp. a nematode of the cat, **542**.
PHYSIOLOGY, GENERAL. Nervous regulation of respiration, heart and blood pressure in the horse, **38** ; anatomy of the amniotic membrane in domestic animals, **142** ; substances promoting normal and abnormal growth, **297** ; thymus and adrenals in the response of the organism to injuries and intoxications, **399** ; compensatory renal hypertrophy, **400**.
See also Blood-brain barrier ; Metabolism ; Vitamins ; Wounds, and under name of organ.
PICA. Of cattle in Germany, **192, 437**.
PIGEON POX. See Pox, in pigeons.
PIGEONS. Diseases, **621**.
See also *Echinoparyphium* ; *Hæmoproteus* ; *Trichinella* ; Trichomonas infection, avian.
PIGLETS. See Anaemia, swine ; Digestive system, diseases ; Influenza, swine.
PIGMENTATION. Abnormal pigmentation in the kidneys and adrenal glands of cattle, **347**.
PIGS. See Swine.
PINE OIL. See Repellents.
PINEAL GLAND. Treatment of hypersexuality in horses by epiphysan, **37**.
PINING. Border pining in sheep, **398**.
PINK EYE. See Influenza, equine.
PIROPLASMOSIS. See Babesia infection ; *Francaiella*.
PITUITARY GLAND.
General. Pregnancy diagnosis of the cow using injections of pituitary extract, **39** ; response of the isolated equine uterus to pituitary extracts, **552, 639** ; pituitary lesion in hairy cows, sequel to foot and mouth disease, **628**.
See also Endocrine system ; Sex hormones.
Anterior. Influence on the thyroid gland of fowls, **88** ; treatment of impotence, **136**.
See also Milk fever.
Posterior. Action of posterior pituitary extracts on the uterus, **638**.
PLACENTA. Anatomy of the amniotic membrane in domestic animals, **142** ; changes in cattle, **628** ; demonstrations of sex hormones in the placental fluid of cattle, **141**.
See also Babesia infection, equine.
Retention of. Causes in the cow, **346** ; therapy, aetiology, clinical experiences, **629**.
Transmission of disease through. Possible prenatal transmission of trichinae from dam to foetus, **125**.
See also Babesia infection, general.
PLANT POISONING. See Poisoning, plant poisoning.
PLASMODIUM INFECTION. Mechanism of the malarial paroxysm, **593** ; *Haemoproteus columbae* of pigeons in India, **171** ; dark field illumination in the diagnosis of malaria, **39**.
PLEURO-PNEUMONIA, CONTAGIOUS.
Bovine. Complement-fixation reaction for diagnosis, **111** ; distribution of the specific organism *Borrelomyces peripneumoniae* throughout the body of animals, **112** ; cultivation of virus on egg embryo, **526** ; antiserum treatment, **172**.

PLEURO-PNEUMONIA, CONTAGIOUS [cont'd].
Caprine, 70 ; nature of a virus isolated from the central nervous system of goats, **331** ; in Palestine, communicability to sheep, **603**.
Equine. See Influenza, equine.
PNEUMATOSIS. See Respiratory system, diseases.
PNEUMO-LYMPHADENITIS. Emphysematous pneumo-lymph-adenitis in cattle, **129**.
PNEUMONIA. Chronic progressive pneumonia of sheep, **239** ; in foals due to *Corynebacterium equi*, **573**.
POISON GASES. See Gases, poisonous.
POISONING.
GENERAL. Report of the Poisons Board in regard to the Poisons List and draft poisons rules prepared in accordance with the Pharmacy and Poisons Act, 1933, **355** ; pathological effect of poisons used for rodents, **355** ; thymus and adrenals in the response of the organism to injuries and intoxications, **399** ; records of poisoning of animals in Prussia, **655**.
See also Doping of horses ; Ergot ; *Gibberella saubinetii* ; Food poisoning ; Gases, poisonous ; Purpura ; Venoms.
Fluorine. In ruminants, **250**; pathological and physiologic studies on dogs, **301**.
See also Bones, diseases.
Inorganic. Comparison of the minimum fatal doses of selenium tellurium, arsenic and vanadium, **443** ; salt poisoning of fowls, **640** ; injurious effect of sodium bicarbonate in chicks, **444** ; zinc poisoning in pigs in New Zealand, **43** ; chronic zinc poisoning of pigs, **399** ; results of feeding various levels of beryllium to chickens, dogs and rats, **641** ; toxicity of thallium sulphate for cattle, **136** ; experimental thallium poisoning in dogs and fowls, **552**.
See also Bush sickness.
Organic. Arsenic, **251** ; dangers of arsenic used for locust poisoning, **38** ; poisoning of livestock by powdered fruit tree insecticides, arsenic, **641** ; toxicity of rhodamin, **641** ; mechanism of polycythaemia in poisoning by carbon tetrachloride, **643** ; by smuts, **43** ; linseed poisoning of horses and cattle, **356** ; cyanogenetic glucoside content of linseed cake, **138** ; toxicity of sodium cyanide and the efficiency of the nitrate-thiosulphate combination as a remedy for poisoned animals, **251** ; toxicity of nicotine sulphate for lambs, **139** ; cattle poisoning by pentatomid bugs *Agonoscelis erosa*, **45**.
Plant poisoning. Plants poisonous to livestock in Western Australia, **301** ; poisonous properties of bracken *Pteridium aquilinum*, **138** ; liver disease of horses, (big liver) caused by the feeding of alsike clover, **356** ; pathology of *Crotalaria spectabilis* Roth seed poisoning in the domestic fowl, **642** ; hellebore poisoning in cattle, **302** ; of cattle by Jamaica nightshade, *Urechites suberecta*, **501** ; mescalbean *Sophora secundiflora* poisonous for livestock, **356** ; toxicity of *Myoporum deserti* for sheep and a calf, **399** ; oak (*Quercus breviloba*) poisoning in range cattle and sheep, **138** ; oat hay poisoning, **641** ; poisoning principle of *Senecio jacoboea*, (ragwort), **43** ; chronic sorghum poisoning in cattle, **642** ; sudan grass and other cyanophoric plants, **138** ; tobacco poisoning in cattle, **302** ; water bloom poisoning of cattle in New York State, **357** ; hydrocyanic acid in white clover, **357** ; poisoning of lambs by wild radish *Raphanus raphanistrum*, **642**.
Selenium. "Alkali disease", **640** ; production of alkali disease in hogs by feeding affected corn, **137** ; duck sickness, **250** ; in proteins from toxic foodstuffs, **136** ; in plants and soils, **149**, **250** ; inhibiting effect of sulphur in selenized soil in toxicity of wheat, to rats, **250** ; poisoning of crops and stock, **301** ; monstrosities produced by selenium in eggs, **137**, **250** ; ability of rats to discriminate between toxic diets, **356** ; occurrence in natural and manufactured phosphates, **301** ; causative factor in pellagra, **640** ; the selenium problem in relation to public health, **640**.
See also Poisoning, inorganic.
POLAND. See *Clostridium tetani* infection, immunization ; Food inspection, meat inspection ; Milk, bacterial content ; Myositis ; Oestridae, warbles.
POLIOMYELITIS. Transmission by animals, **530**.
See also Antibodies.
POLL EVIL. See Brucella infection, in horses.
PORTUGAL. See Leishmania infection ; See also *M. tuberculosis* infection, avian type infection ; Reports, Portugal.
PORTUGUESE GUINEA. See Trypanosoma infection.
POTASSIUM. See Nutritional diseases.
POULTRY, GENERAL. 6th World Poultry Congress, 1936, **495** ; poultry health service of the Reichsnährstand, **496**.
See also Ducks ; Fowls ; Geese ; Turkeys.
Diseases general. Research on poultry diseases, **28** ; mortality problem in poultry, **28** ; work of the Reich centre for research and control of poultry diseases at the Reichsgesundheitsamt, **543** ; helminthic parasites of poultry in the South Wales area, **608**.
See also *Bact. tularense* infection [tularemia] ; Eimeria infection, avian.
POX.
General. In domestic animals, **426** ; relation of sheep pox to vaccinia and variola, **534**.
In fowls. In Illinois, **117** ; diphtheric form in India, **532** ; transmission, **532** ; efficacy of vaccines, **323** ; vaccination of chicks, **332**, **532** ; growth of virus on egg embryo, **22**, **526** ; identity between the virus of fowl pox and the vaccine virus, **75** ; immunological relationships between Kikuth's canary virus and fowl-pox, **532**.
In goats, 534 ; in India, **426**.
In rabbits, 278.
In sheep, 75, **426**, **534** ; virus, **426** ; control in Yugoslavia, **179**.
In swine, 530 ; causal agent, **331**.
PRECIPITIN TEST. For cysticercosis of pork, **124**.
See also Brucella infection, diagnosis [general] ; Glossina ; Swine fever, diagnosis ; *Trypanosoma equiperdum* infection [dourine].
PREGNANCY, DIAGNOSIS.
General. Hormonal diagnosis, **88**, **400** ; chemical tests, **198**.
See also Sex hormones.
In cows, 660 ; using injections of pituitary extract, **39**.
In mares. Manual examination, **346** ; examination for hormone of the serum and urine, **140** ; Cuboni's chemical test, **198**, **447** ; comparison of Cuboni's test and the biological test, **303**.
PREGNANCY DISEASE OF EWES, 295, **485**.
PREGNYL. Influence of subcutaneous injections on the sexual organs of the calf, heifer, piglet, pig, and dog, **443**.
PRESERVATION OF MUSEUM SPECIMENS. See Technique, general.
PRESSURE, ATMOSPHERIC. See Bacteria general, viability ; Bacteriophage ; Neoplasms, general ; Viruses, viability.
PROLACTIN. Clinical use, **492**.
PROLAN. Treatment of agalactia in mares and sows, **37**.
See also Pituitary gland, anterior.
PRONTOSIL. Action on experimental streptococcal infections, **637**.
See also P-amino-phenyl sulphamide.
PROSTATE GLAND. Diseases in dogs, **546**.
PROSTHOGONIMUS. Of poultry in Bavaria, **281**.
PROTEINS. See Centrifugation ; Immunity.
PROTOZOA, GENERAL. Of domestic animals in North Africa, **164** ; in Iran, **80** ; in Rumania, **162** ; in Russia, **164** ; in Yugoslavia, **416** ; in wild rats in Baltimore, **162** ; immunity, **433**, **590** ; method of plotting logarithmic growth-curves of protozoal cultures, **274** ; parasite reactions to host modifications, **415** ; viability after the death of the host, **328** ; enlarged spleens in veterinary protozoology, **13** ; electric charge of haemoflagellates, **647**.
See also *Aegyptianella* ; *Anaplasma* ; *Babesia* ; Digestive system, flora ; *Eimeria* ; *Entamoeba* ; *Histomonas* ; *Isospora* ; *Leishmania* ; *Leptospira* ; *Plasmodium* ; *Rickettsia* ; *Sarcosporidia* ; *Spirochaeta* ; Theileria infection ; *Trichomonas* ; *Trypanosoma*.
PRUSSIC ACID. See Hydrocyanic acid ; Poisoning, organic, plant poisoning.
PSEUDAMPHISTOMUM. *Ps. truncatum* in a silver fox, **608**.
PSEUDO-FOWL PLAGUE. See Newcastle disease.
PSEUDOMONAS. See Rhinitis.
PSEUDO-RABIES. See Aujeszky's disease.
PSITTACOSIS, 604 ; in Leipzig, **118** ; in Austria, **379** ; in man in Australia, **119** ; in parrots imported into the Argentine, **603** ; diagnosis in birds, **119** ; cultivation of virus on egg embryo, **526**.
PSOROPTES. See Mange.
PTERIDIUM AQULINIUM. See Poisoning, plant poisoning.
PUBLIC HEALTH. Parasites of animals and the public health in North America, **352** ; aspects of veterinary public health in U.S.A., **439** ; relation of animal nutrition to public health in India, **648**.
See also Food inspection ; Food poisoning ; Milk, bacterial content, hygiene ; Poisoning, selenium ; Refrigeration ; Vermin control ; Services, veterinary.
PUERTO RICO. See Parasitic infestation, general.
PULLORUM DISEASE. See *Salmonella pullorum* infection [bacillary white diarrhoea].
PULPY KIDNEY DISEASE. See Clostridium infection, in sheep.
PURPURA. In animals, **544**.
PYELONEPHRITIS. Of cattle and horses, **481**, **546**.

Q

QUAIL. See *Salmonella pullorum* infection.
QUERCUS BREVILOBA. See Poisoning, plant poisoning.

R

RABBITS.
General. See Books, diseases, general ; Paralysis.
Bacterial diseases. See *B. anthracis* infection ; *M. tuberculosis* infection, avian type infection ; Salmonella infection, in rabbits.
Physiology. See Blood, coagulation ; Eyes, general ; Reticulo-endothelial system.
Protozoan diseases. See Eimeria infection ; Trypanosoma infection.
Virus diseases. See Fibroma ; Papilloma ; Pox, in rabbits ; Rabies, virus.
RABIES.
General. In Germany, Czechoslovakia and Yugoslavia in 1935, **73** ; first diagnosis in Uganda, **498** ; in South Africa, **601** ; report of Committee on Rabies of the U.S.A. Livestock Sanit. Ass., **529** ; susceptibility of Chinese hamsters to rabies, **425** ; co-existence with canine spiroptera infestation, **425** ; intra-endothelial bodies in the vessels of the brain and spinal cord, **600**.
Immunity. Natural immunity of the dog, **74**.
Immunization, 330 ; prophylactic immunization as the sole means of controlling canine rabies, **74** ; value of frozen rabid spinal cords, **74** ; response to vaccine prophylaxis as shown by protection tests, **177** ; results of preventive inoculation, **601** ; simplified vaccination, **601** ; post-inoculation encephalomyelitis in rabies, **601** ; experimental rabies in white mice, passive immunization, **471**.
Negri bodies. Formation in regenerated corneal epithelium, **177** ; comparison of the mesencephalon and hippocampus as sites of election, **600**.
South American rabies. In the vampire bat in Trinidad, **528** ; natural transmission by vampire bats, **601**.
Viability. Viability at certain temperatures, **470** ; action of dilution on street virus, **471** ; effect of freezing on spinal cords of rabid animals, **424**.
Virus. Size by ultrafiltration analysis, **377** ; cultivation *in vitro*, **331** ; virus of rabies and neoplastic cells, **74, 600**.
Virus [fixed]. Transformation into street virus, **74, 177** ; examination of virus used at Beirut, **425** ; transformation of a Pasteur fixed virus into a street virus, **177** ; serial neural passage of fixed virus in the rabbit with restoration of Negri bodies, **177**.
RADIATION. See Irradiation.
RADIOGRAPHY. See Entamoeba infection.
RADISH. See Poisoning, plant poisoning.
RAGWORT. See Poisoning, plant poisoning.
RAILLIETINA. The cysticercoid of *R. cesticillus*, **183** ; ants as intermediate hosts for two species parasitic in chickens, **231**.
RAPHANUS RAPHANISTRUM. See Poisoning, plant poisoning.
RAT BITE FEVER. See Spirochaeta infection.
RATS. Infection by *Erysipelothrix rhusiopathiae*, **514**.
See also Brucella infection general ; Cobalt, metabolism ; Poisoning, selenium ; Protozoa general.
REACTIONS. See Tests.
REFRIGERATION. See Freezing.
REGULATIONS. See Food inspection ; Law ; Milk, hygiene.
REINDEER. See Eimeria infection ; Respiratory system, diseases.
REPELLENTS. Prevention of myiasis in wounds of domestic animals by the use of bone oil, **36** ; role of pine oil in cattle fly sprays, **442** ; dusts for control of flies on cattle, **442** ; improved method for the determination of cattle fly spray repellence, **492**.
REPORTS.
Algeria. Pasteur Institute, Algiers, 1935, **309**.
See also Reports, France.
Australia. New South Wales, Livestock Diseases Report, recording control work, for 1934-1935, **146** ; ninth annual report of the Council for Scientific and Industrial Research for 1935, **201** ; ten years of progress of the Council for Scientific and Industrial Research, 1926-1936, **495**.
Austria. Federal Institute for Animal Diseases, Mödling, near Vienna, 1935, **502**.
British Guiana. Veterinary Division for 1935, **305**.
British Somaliland. Veterinary and Agricultural Department for 1935, **44**.
Bulgaria. 11th Yearbook of the Veterinary Medical Faculty, University of Sofia, 1934-35, **143**.
Ceylon. Government Veterinary Surgeon Ceylon, for 1934, **204** for 1935, **358**.
Colombia. Veterinary Congress, Bogotá, July, 1936, **560**.
Cyprus. Veterinary Service for 1935, **306**.
Czechoslovakia. Sixth Conference for Preventive Medicine 1936, Report of Veterinary Section, **150**.
Dutch West Indies. Veterinary Service Curacao, 1934, **308**.
Eritrea. Serum and Vaccine Institute of Eritrea for 1934-1935, **402**.
Estonia. Civil Veterinary Report for 1933-1934, **308**.
Falkland Islands. Stock Report for 1934-1935, **307**.
Federated Malay States. Veterinary Department for 1934, **651**.
Fiji. Veterinary Division, 1935, **256**.
Finland. Civil Veterinary Service for 1935, **560**.
France. Army Veterinary Statistics for France, Algeria, Tunis, Morocco and the Levant, for 1934, **45** ; Statistical Veterinary Report of the French Home and Colonial Army for 1935, **652** ; Military Veterinary Laboratory for 1935, **45** ; for 1936, **652**.
Germany. Government Veterinarians, Prussia for 1933 and 1934, **653** ; 8th meeting of the veterinary specialists for the campaign against diseases of breeding animals and new-born livestock at Berlin 1936, report, **290**.
Gold Coast Colony. Department of Animal Health, 1935-1936, **148**.
Great Britain [central government reports]. Chief Veterinary Officer to the Secretary of the Ministry of Agriculture and Fisheries for 1935, **91** ; Chief Medical Officer of the Ministry of Health, for 1935, **502** ; Development Commissioners for 1935-1936, **502** ; Statistical and General Report, Army Veterinary Services, 1935-1936, **306**.
Great Britain [municipal and county reports]. Items of Veterinary Interest from Municipal Reports, Bolton, 1936, Liverpool, 1936, Manchester, 1936, Newcastle, 1936, Preston, 1936, Salford, 1936, **144-145**.
Great Britain [research work, etc.] Report of the Director, Veterinary Laboratory, Weybridge to the Chief Veterinary Officer, for 1935, **92** ; the Annual Congress of the National Veterinary Medical Association, Great Britain, 1936, **143** ; Hannah Dairy Research Institute, for 1936, **200** ; National Institute for Research in Dairying, Reading, 1933-1934 and 1934-1935, **503** ; Agricultural Research Council for 1933-1935, **199** ; Medical Research Council for 1935-1936, **656** ; Lister Institute of Preventive Medicine, 1936, **93** ; Thirty-fourth Annual Report of the Imperial Cancer Research Fund, **658** ; Thirteenth Annual Report of the British Empire Cancer Campaign, 1936, **658**.
Holland. Veterinary Inspector for Public Health and Meat Inspection for 1935, **358** ; Report on Animal Health in Friesland, 1935-1936, **45**.
India. Civil Veterinary Department Assam for 1935-1936, **554** ; Civil Veterinary Department Bengal for 1934-1935, **555** ; Civil Veterinary Department Berar and Central Provinces, for 1935-1936, **556** ; Civil Veterinary Department for the Year 1935-1936, Bihar and Orissa, **556** ; Stud and Veterinary Department of H.E.H. the Nizam's Government, Hyderabad-Deccan for 1934-1935, **559** ; Civil Veterinary Department for 1935-1936, Madras, **557** ; Civil Veterinary Department Mysore for the Year 1935-1936, **559** ; Civil Veterinary Department for the Year 1935-1936, Punjab, **558** ; Civil Veterinary Department for 1935-1936, United Provinces, **558** ; Twelfth Conference of Medical Research Workers held at Calcutta, November-December, 1934, **203**.
International. Third International Congress of Comparative Pathology, 1936, **657** ; Office international des Epizooties, 1935-1936, **255**.
Italy. Veterinary Research Institute, Padua, for 1935, **401**.
See also Reports, Eritrea.
Jamaica. Government Veterinary Surgeon for 1935, **501**.
Malta. First Progress Report of the Undulant Fever Committee, **579**.
Morocco. Veterinary Research Laboratory for 1935, **46** ; Military Veterinary Laboratory for 1935, **46**.
See also Reports, France.
New Zealand. Department of Agriculture, Report of the Chemistry Section and on Nutritional Research, **43** ; Wallaceville Veterinary Laboratory, **42**.
Nigeria. Veterinary Department, 1935, **147**.
Northern Rhodesia. Veterinary Department for 1935, **149** ; Veterinary Research Station, Mazabuka, for 1935, **150**.
Norway. Oslo Abattoir for 1935, **307**.
Nyasaland. Veterinary Department for 1935, **651**.
Palestine. Chief Veterinary Officer's Report for 1934-1935, **452** ; Veterinary Pathologist's Report for 1934-1935, **453**.
Portugal. Camara Pestana Institute 1933-1935, **501**.
St. Lucia. Livestock Industry in 1935, **256**.
Southern Rhodesia. Ministry of Agriculture, Division of Entomology for 1935, **44** ; Ministry of Agriculture, Branch of Chemistry for 1935, **45**.
Spain. Veterinary College, Madrid, 1935, **97**.
Straits Settlements. Veterinary Department for 1934, **651**.
Sudan. Veterinary Service 1935, **94** ; for 1936, **499** ; Veterinary Research Officer for 1935, **95** ; for 1936, **500**.
Sweden. Civil Veterinary Service for 1935, **655**.
Switzerland. Veterinary Division, Department of Public Economy for 1935, **96**.

REPORTS [cont'd].
Syria. Military Veterinary Laboratory for 1935, **47**.
See also Reports, France.
Tanganyika. Department of Veterinary Science and Animal Husbandry 1935, **649** ; Veterinary Laboratory Mpwapwa, 1935, **650**.
Trinidad and Tobago. Veterinary Division, 1935, **204**.
Tunis. Pasteur Institute, 1935, **46** ; Veterinary Service, Tunis, for 1935, **453**.
See also Reports, France.
Uganda. Veterinary Department for 1935, **497** ; Veterinary Pathologist for 1935, **498**.
Union of South Africa. Division of Veterinary Services for 1935, **554** ; for 1936, **648**.
United States of America. Wisconsin Experimental Station, U.S.A., **97** ; Wyoming Agricultural Experiment Station for 1934-1935, **149** ; Report of the American Veterinary Medical Association Representative to the National Research Council, 1936, **454** ; Division of Veterinary Science Michigan State College of Agriculture and Applied Science 1935, **560**.
See also Committees ; Rabies.
REPRODUCTION. See Breeding ; Genital system ; Insemination, artificial.
RESEARCH INSTITUTES. Isle of Riems Research Centre, **40** ; The responsibilities of the Director of a Medical Research Laboratory, **305**.
See also Reports, Austria, Great Britain [Research Work, etc.], Portugal.
RESISTANCE TO INFECTION. See Infection, resistance to.
RESPIRATORY SYSTEM.
General. Reaction of the lungs in subcutaneous immunization, **26** ; permeability of the lungs to antibodies, **236** ; serological specificity of lung tissue, **619**.
See also Bacteria general, viability.
Diseases. Classification of diseases in horses, **222** ; respiration in broken winded horses, **436** ; allergic reactions for haymoulds in "broken wind", **476** ; cystic pneumatosis of lymph nodes in the horse, **622** ; acute pulmonary congestion of cattle in Yugoslavia, **627** ; lung disease in reindeer calves, **627**.
See also *Angiostrongylus* ; Bronchitis, infectious equine ; Bronchitis, verminous ; Broncho-pneumonia ; Catarrh ; Corynebacteria ; Coryza ; Eucoleus infection ; Fowls, virus diseases ; Fungi ; Influenza ; Laryngo-enteritis, infectious ; Laryngotracheitis ; *M. tuberculosis* infection ; Pleuro-pneumonia ; Pneumo-lymphadenitis ; Pneumonia ; Psittacosis ; Rhinitis ; Roaring ; Silicosis ; Skalma ; Viruses, pneumotropic.
RETICULO-ENDOTHELIAL SYSTEM. Proliferative processes, **348** ; significance in infectious diseases, **78** ; role in active immunity to tuberculosis, **572** ; response to immunization with paratyphoid vaccine in rabbits, **78** ; dependence of the therapeutic results of serum treatment upon the intactness of the reticulo-endothelial system, **78**.
REVIEWS. Council for Scientific and Industrial Research, Ten Years of Progress, 1926-1936, **495** ; Biennial Reviews of the Progress of Dairy Science, Reproduction and Lactation of Cattle, Nutrition, Genetics, **450** ; Mastitis, Contagious Abortion, Tuberculosis, **238** ; research on poultry diseases in 1935, **28** ; review on fowl diseases in Sweden, **239** ; review of the 1935-1936 laying trials, mortality in hens, **342** ; important diseases of game animals, **238** ; diseases of fur-bearing animals, **483** ; principles of sanitary legislation, **304** ; international veterinary conventions, **304** ; antigens, antibodies and immunity, **617** ; milk and nutrition, **644** ; experimental cancers and neoplasms, **240** ; male sex hormones, **553** ; follicular hormones, **506** ; parasites and parasitic diseases of cattle in Puerto Rico, **230** ; endocorpuscular blood parasites in animals, **164** ; virus diseases, the present position, **274** ; pneumotropic virus diseases in man and animals, **526** ; spontaneous virus diseases in common laboratory animals, **473** ; psittacosis, **604** ; results and progress in antimony therapy, **505**.
See also Books ; Statistics.
RHEUMATISM. Rheumatic disease in horses, **435**.
See also Bones, diseases.
RHINITIS, INFECTIOUS. Capsulated bacteria from swine affected with infectious rhinitis, **111** ; in pigs in the U.S.A., **544**.
RHIPICEPHALUS. See Babesia infection, canine ; Rickettsia infection ; Ticks.
RHODAMIN. See Poisoning, organic.
RICKETS. Anatomical changes in the bones and their relationship to rickets, **134** ; pathology of rickets in dairy calves, **296** ; rickets-like disease in young cattle, **191** ; influence of solar ultraviolet radiation upon the blood chemistry and mineral metabolism of calves, **253** ; of young sheep in New Zealand, **32** ; splenic hypertrophy in experimental rickets, **83** ; anti-rachitic action of certain vegetable oils, **639** ; antirachitic effectiveness of vitamin D from various sources, **85** ; antirachitic value of hay in the ration of cattle, **252**.
RICKETTSIA INFECTION. *Rickettsia* and rickettsia infections, **113** ; *R. bovis* a new species pathogenic for cattle, **524** ; a new *Rickettsia* of sheep, **380** ; *R. conjunctivae* in sheep in Algeria, **524** ; rickettsiasis from ticks from wild pigs, **468** ; *Rickettsia* seen in ticks in Egypt, **420** ; comparison of *R. canis* and *R. conori*, **524** ; mechanism of immunity in typhus fever in relation to rickettsia infection, **478**.
See also Heartwater.
RIFT VALLEY FEVER. Susceptibility of rodents, **426**.
RINDERPEST.
General. Period of incubation, **174** ; concurrent infections with rinderpest and vaccinia, **174** ; dextrose fermenting aerobes in the spleen and lymph nodes of infected cattle, **595** ; differential diagnosis and treatment, **422** ; in India, **422**.
Blood changes. Serum protein changes induced by virus, **114** ; protein changes in ox and goat serum induced by hyperimmunization against virus, **275**.
Immunization. In India, **173**, **468** ; single or multiple dose vaccination against rinderpest, **173** ; experiments with bull virus on animals protected with goat virus, **173** ; duration of immunity in cattle inoculated with goat virus alone, **595** ; refractometric index of the serum of hyperimmune cattle, **595** ; dried vaccine, **595** ; immunizing power of vaccinia lymph from animals affected with rinderpest, **422**.
Virus. Infectivity and viability, **174** ; relationship between the viruses of rinderpest and Newcastle disease, **605**.
RINGBONE. Associated with tuberculosis, **260**.
RINGWORM. Of dogs in Algeria, **162** ; epidemic spread by a cat, **162** ; trials of fungicides in hair infected with *Trichophyton equinum*, **299**.
See also Trichophyton infection.
ROARING. Paralysis of the recurrent laryngeal nerve of the horse, **623**.
ROUNDWORMS. See Nematodes.
RUMANIA. See Catarrh, malignant bovine.
RUMEN. See Digestive system.
RUMINANTS. See Cattle ; *Clostridium tetani*, immunization ; Elk ; Goat ; Moose ; Reindeer ; Sheep.
RUSSIA. See Union of Socialist Soviet Republics.
"RUST". See Skin, diseases.

S

ST. LUCIA. See Reports.
SALIVARY GLAND VIRUS. Visceral lesions produced in mice by the salivary gland virus of mice, **534** ; susceptibility of the g. pig foetus to the virus, **534** ; ultracentrifugation of intranuclear inclusions in the submaxillary glands of g. pigs and ground moles, **534**.
SALMONELLA GROUP.
General. Toxin production by *Salmonella*, **159** ; a new *Salmonella* as the cause of abortion in cattle, **58**.
Antigenic structure. Vi antigen of *Bacillus typhosus*, **288**.
See Salmonella group, differentiation.
Cultivation. Oxidation-reduction potentials in salmonella cultures, **209** ; demonstration of meat poisoning organisms by malachite green medium, **352**.
Differentiation, 318 ; antigenic characteristics of related organisms after cultivation on synthetic medium, **162** ; fermentative varieties of *S. aertrycke*, **209** ; antigenic relationships of the *pullorum-gallinarum* group, **268** ; of *coli* and salmonella groups by Hökl's culture medium, **367** ; type differentiation in 561 colonies of *S. enteritidis*, **411**.
Dissociation. Rough *S. pullorum* variants from chicks, **268** ; variants of *S. typhi-murium* and of the somatic antigen, **9** ; serological variant of *S. typhi-murium* from pigeons, **159** ; serological variants of *S. typhi-murium*, **209**.
Viability. Resistance of *S. pullorum* to the action of various disinfectants, **210** ; resistance to fumigation in incubators at full capacity, **451** ; resistance on sterilized and unsterilized egg shells, **451** ; effect of ultra-violet rays on *S. choleraesuis*, **64** ; resistance of *S. aertrycke S. anatum* and salmonella from quail to formaldehyde fumigation, **451** ; viability of *S. enteritidis* Breslau, **411**.
SALMONELLA INFECTION [PARATYPHOID].
General. Occurrence of enteritis (*S. typhi-murium*) in cats and its transmission to man, **628**.
See also Food poisoning.
In cattle. Bovine paratyphoid carriers, **411**.
See also Salmonella group, general.
Control. In cattle, **412**.
Diagnosis, 576 ; spot method of conducting whole blood agglutination tests with stained antigen, **615**.
In ducks, 8 ; serological diagnosis of duck paratyphoid, **8** ; in palmipeds ; **210**.
See also Salmonella infection, diagnosis ; *Salmonella pullorum* infection.

SALMONELLA INFECTION [PARATYPHOID] [cont'd].
In fowls, 319.
See also *S. gallinarum* infection [fowl typhoid] ; *S. pullorum* infection [bacillary white diarrhoea].
In foxes, 159, 576.
Immunization, 58, 59 ; subcutaneous and peroral inoculation, **319** ; reticulo-endothelial response to immunization with paratyphoid vaccine in rabbits, **78** ; immunizing potency of antigenic components isolated from different strains of *S. typhi*, **616.**
See also Bacteria general, immunity ; Salmonella infection, in ducks ; Vaccines.
Meat poisoning. Food poisoning in Egypt associated with anaerogenic strains of *Bacterium aertrycke*, **351** ; *S. typhi-murium* infection, **439** ; prevention, **492.**
See also Food inspection, meat inspection ; Food poisoning, meat poisoning ; Salmonella group, cultivation ; Salmonella infection, in cattle.
In pigeons. In Holland, **320.**
See also Salmonella group, dissociation.
In rabbits. Infection with *S. typhi-murium*, **268.**
In swine. Spontaneous infection, **59.**
In turkeys. *S. typhi-murium* infection, **210** ; occurrence of salmonella, Senftenberg type, in a disease of turkeys, **576.**
See also *S. pullorum* infection.
S. ABORTUS-EQUI INFECTION [EQUINE ABORTION], 318 ; control, **58** ; diagnosis by the formol-gel reaction, **478** ; a case of infection with *Bact. abortus-equi* in a veterinary surgeon after attending a case of equine abortion, **318.**
S. AERTRYCKE. See *S. typhi-murium*.
S. ANATUM. See Salmonella group, viability. Salmonella infection, in ducks.
S. CHOLERAE-SUIS. See Salmonella group, viability ; Salmonella infection [paratyphoid], in swine.
S. ENTERITIDIS. As secondary invader in strangles, **507.**
See also Salmonella group, dissociation ; viability.
S. GALLINARUM INFECTION [FOWL TYPHOID], 268 ; significance of some positive and erroneous results of the agglutination test of fowls for fowl typhoid, **269.**
See also Salmonella group, differentiation.
S. ONDERSTEPOORT. A new type of salmonella from a sheep, **318.**
S. PULLORUM INFECTION [BACILLARY WHITE DIARRHOEA]. Serological studies on adult carriers, **59** ; incidence in eggs from infected hens, **210** ; in turkeys, **210** ; in ducklings, **577** ; in captive quail, **577** ; control in Denmark, **484** ; titre fluctuation in agglutination tests in hens, **268.**
See also Salmonella group, differentiation, dissociation, viability.
S. TYPHI-MURIUM. See Salmonella group, dissociation, viability ; Salmonella infection [paratyphoid].
SARCOCYSTIS INFECTION. Sarcocystis present in the central nervous system of the sheep with the virus of "louping ill", **328.**
SARCOSPORIDIA INFECTION. Sarcosporidial cysts in the muscles of swine, **68.**
SCABBY BARLEY. See *Gibberella saubinetii*.
SCHERN-GORLI RING TEST. See Milk, verification of animal of origin.
SCHISTOSOMA. Polymorphism of the eggs of *S. haematobium* and eggs of the bovine type in man in the Belgian Congo, **24** ; life history of *S. turkestanicum*, **282** ; skin reaction caused by *S. japonicum* cutaneously applied on the animals, **282.**
SCHISTOSOMA INFECTION. In cattle in Italy, **183** ; schistosome dermatitis, **231** ; attempted cure in stock, **282** ; destruction of carriers, **610.**
SCRAPIE, 625 ; relation to fowl paralysis, **625.**
SCROTUM. Development of the testes and scrotum of the ram, bull and boar, **141.**
SCURVY. See Vitamins, vitamin C.
SELENIUM. See Poisoning selenium.
SEMEN. The semen of stallions in Russia, **88.**
SENECIO JACOBOEA. See Poisoning, plant poisoning.
SENSITIZATION. Anaphylaxis and sensitization, **79** ; studies on the sensitization of animals with simple chemical compounds, **431.**
See also Allergy ; Anaphylaxis ; Antigens.
SERUM. See Blood, serum.
SERVICES, VETERINARY. Duties and status of a municipal veterinary officer, **199** ; veterinary service in the control of milk products, **89** ; Canadian Health of Animals Branch and its relation to public health, **451** ; co-operation between the Division of Veterinary Services and the farmer in South Africa, **304** ; police organization and veterinary administration in Germany, **40** ; state veterinary investigation offices in Prussia, **40** ; poultry health service of the Reich Nährstand, **496** ; army veterinary service in Russia, **90.**
See also Law, Denmark ; Reports ; Research institutes.
SETARIA. On the nomenclature and synonymy of the nematode "*Setaria labiato-papillosa*", **387** ; verminous ophthalmia of horses in Indochina caused by *Setaria*, **612.**
SEX HORMONES. See Hormones, sex hormones.
SEXUAL CYCLE. Analysis of variations in the sexual cycle with special reference to cattle, **553.**
SHEEP.
General. See Milk, verification of animal of origin ; Trypsin ; Wool.
Arthropod parasites. See Blowflies ; Dips ; Mange ; Oestridae, bots ; Ticks.
Bacterial diseases. See Clostridium infection, in sheep ; *Cl. botulinum* infection ; *Cl. tetani* infection ; *Corynebacterium pseudotuberculosis* infection ; *Erysipelothrix rhusiopathiae* infection, in sheep ; *Mycobacterium paratuberculosis* infection [Johne's disease] ; Pasteurella infection, in sheep.
Diseases general, 621 ; in Germany, **291** ; field and laboratory diagnosis of diseases, **543** ; diagnosis and control of diseases of rams and of abortion of ewes, **28** ; investigation of the nutritional and biochemical effects of a low calcium diet on sheep, **83.**
See also Acidosis ; Bush sickness ; Circling disease ; Cryptorchidism ; Icterohaemoglobinuria ; Ketosis ; Kidneys, diseases ; Nutritional diseases ; Parasitic infestation general ; Pining ; Poisoning, plant poisoning ; Pregnancy disease of sheep ; Respiratory system, diseases ; Rickets ; Scrapie ; Silicosis ; "Swayback".
Genital system. See Embryo ; Oestrus ; Scrotum ; Testis.
Helminth parasites. See Carbon tetrachloride ; Helminth parasites, sheep parasites ; Liver flukes ; Nematodes.
Physiology. Influence of bowel anastomosis on the general nutritional state of merino sheep, **86.**
See also Blood, coagulation, picture ; Bones ; Digestive system ; Physiology ; Eyes ; Intestines ; Iodine ; Magnesium ; Skin.
Poisoning. See Poisoning, plant poisoning.
Protozoan diseases. See Anaplasma infection, ovine ; Rickettsia infection ; Sarcocystis infection ; Trypanosoma infection, in sheep.
Virus diseases. See Bluetongue ; Dermatitis ; Heartwater Pleuro-pneumonia in goats ; Pox, in sheep ; Swine fever.
SHEEP POX. See Pox, in sheep.
SHEEP SCAB. See Mange.
SHWARTZMAN PHENOMENON. See Allergy.
SILICOSIS. In Saharan sheep, **486.**
SILVER FOXES. See Foxes.
SIMULIUM. Simuliids annoy livestock, **23.**
SKALMA. In horses, **223** ; simultaneous occurrence of "skalma" of horses and glandular fever of man, **344.**
SKELETAL DISEASE. In the horse, **435.**
See also Bones, diseases ; Rheumatism.
SKIN.
General. Seasonal variations in lamb skins with special reference to the sudoriferous glands, **303.**
Diseases. Tuberculous pachydermia in swine, **51** ; pyodermatitis in horses, **72** ; "rust" or "soot" in pigs, **130** ; invasiveness of skin infections caused by pathogenic fungi and subsurface mycelium, **374.**
See also Cysts ; Dermatitis ; Eczema ; *M. tuberculosis* infection, in cats, in swine ; Schistosoma infection.
SLAUGHTER. Muscle haemorrhages in animals stunned by hammer, captive bolt or electricity, **491.**
SLIPPED TENDON. See Perosis.
SNAKES. See Venoms.
SODIUM BICARBONATE. See Poisoning.
SODIUM CHLORIDE. See Foot and Mouth Disease, viability.
SOIL. See Actinomycetes ; Cobalt ; Nutritional diseases ; *M. tuberculosis* infection, avian type infection.
"SOOT". See Skin, diseases.
SOPHORA SECUNDIFLORA. See Poisoning, plant poisoning.
SORGHUM. See Poisoning, plant poisoning.
SOUTH AFRICA. See Union of South Africa.
SOUTHERN RHODESIA. See Reports, Southern Rhodesia ; Ticks ; Trypanosoma infection, general.
SPAHLINGER VACCINE. See *Mycobacterium tuberculosis* infection immunization.
SPAIN. See *Brucella abortus* infection, control ; Helminth parasites, horse parasites ; *M. tuberculosis* infection, in milk.
SPARROW. See Eimeria infection [coccidiosis], avian.
SPIROCHAETA GALLINARUM. See Spirochaeta infection avian.
SPIROCHAETA INFECTION.
General. Rat bite fever from a cat, **23.**
See also Leptospira infection.
Avian, 69, 419 ; *Culex*, a new vector of *Sp. gallinarum*, **69** ; attempts to transmit fowl spirochaetosis by *Dermanyssus gallinae*, **607.**
In cattle. Spirochaetal jaundice in Russia, **419.**
SPIROPTERA. Co-existence of canine spiroptera infestation and rabies, **425.**

SPIRURIDAE. See *Acuaria*; *Habronema*; *Oxyspirura*; *Physaloptera*; *Tropisurus*.
SPLEEN. Enlarged spleens in veterinary protozoology, **13**; splenic hypertrophy in experimental rickets, **83**; effect of splenectomy in anaplasmosis of sheep, **16**.
See also Anaemia, equine infectious.
SPONDYLITIS. Spondylitis in swine caused by *Br. abortus*, **61**.
SPOTTED KIDNEYS. Connexion between *Br. abortus* infection and spotted kidneys in calves, **320**.
STAINING. Two new double stains, **253**; improvements on Ziehl's staining method, **253**; Kozlovskij's method of staining *Br. abortus*, **401**; staining of leprosy and tubercle bacilli, **401**.
See also Bacteria, general, technique [staining]; Trichinella; Viruses, staining.
STANDARDIZATION OF BIOLOGICAL PRODUCTS. See Antisera; *M. tuberculosis*, tuberculin; Vaccines.
STAPHYLOCOCCUS.
General. Role in the production of actinomycosis, **101**; staphylococcic mastitis, **456**, **508**; electro-antivirus, **392**; failure of staphylococci to grow from small inocula in routine laboratory media, **314**; use of cutaneous staphylococcus lesions in mice for the evaluation of the germicidal activity of disinfectants, **638**.
See also Mastitis, bovine.
Differentiation. Determination of types by fermentation of mannite, **566**; isolation of probable pathogenic staphylococci, **566**; identification of antigenic types, **567**.
Dissociation. Into alpha and beta toxigenic variants, **257**.
Immunity, 479; immunological specificity of staphylococci, cutaneous reactions to the type-specific carbohydrates, **314**; naturally acquired immunity in the g. pig, **187**.
Toxins, 288; toxin-producing staphylococci and staphylococcus antitoxin in the g. pig, **187**; purification of staphylococcus toxoid, **287**; combined staphylococcal endo- and exo-antigen, **287**; mechanism of immunity conferred by staphylococcus anatoxin, **288**; relations between toxins of staphylococci and those of the gas gangrene group, **392**.
STAPHYLOCOCCUS AUREUS. Nutrition of *Staph. a*, nicotinic acid and vitamin B_2, **567**.
See also Mastitis, staphylococcic.
STASSANIZATION. See Milk, bacterial content.
STATISTICS. For the veterinarian, **306**; statistical interpretation of data in experimental tuberculosis, **409**.
See also *M. tuberculosis* infection, control.
STEPHANOFILARIA. In buffaloes, **76**.
STEPHANURUS. Stephanurosis in pigs in French Guiana, **76**; control and eradication of kidney-worm disease of swine (*S. dentatus*), **338**.
STERILITY.
General. Of male animals, **346**; experimental sterility in rats, **43**.
See also Abortion; Brucella infection; *S. abortus-equi* infection [equine abortion]; Hormones; Trichomonas infection, bovine.
In horses, 345; in mares and the treatment of new-born foals, **629**; campaign against sterility in mares in Germany, **239**, **481**.
In cattle. In bulls in New Zealand, **42**; in Germany, **545**; obligatory bovine sterility campaign in Thuringia, **481**.
Treatment. Hormonal treatment, **355**.
STERILIZATION. Hormonal sterilization, **355**.
STOMACH. See Digestive system.
STOMACH WORMS. See *Cooperia*; *Haemonchus*; Helminth parasites, sheep parasites; Nematodes; *Ostertagia*; Strongyles; *Trichostrongylus*.
STOMATITIS, CONTAGIOUS PUSTULAR. Atypical form in goats and lambs, **379**.
STOMATITIS, VESICULAR. Growth of virus on egg embryo, **526**.
See also Foot and mouth disease; Viruses, size of particles.
STOMATOPHARYNGITIS, DIPHTHERIC. In fowls in Federated Malay States, **651**.
STORK. Diseases of Moroccan storks, **423**.
See also Encephalomyelitis, equine.
STRAITS SETTLEMENTS. See Reports, Straits Settlements.
STRANGLES. See *Streptococcus equi* infection.
STREPTOBACILLUS MONILIFORMIS. Biology, pathogenesis and classification, **462**; pleuropneumonia-like organism in the lung lesions of rats, **583**.
STREPTOCOCCAL MASTITIS. See Mastitis, bovine; *Streptococcus*.
STREPTOCOCCUS.
General. Incidence and types of streptococci in first-calf heifers at parturition, **311**; fibrinolytic activity of streptococci from man and animals, **312**; reactions of tissues from g. pigs infected with group C haemolytic streptococci, **390**; relationship of pig farming to the occurrence of souring streptococci in milk and milk-products, **438**; habitat of *Str. lactis*, **257**; *Str. equinus*, **507**.
Cultivation. Isolation in pure culture of streptococci from contaminated material, **311**.
Haemolytic. Serological differentiation of hemolytic streptococci, **2**; studies on haemolytic streptococci, *Str. pyogenes*, **49**; haemolytic streptococci and properties of antiserum, **566**; incidence and significance of beta haemolytic streptococci in cultures from a selected group of milk handlers, **313**.
See also Streptococcus, general; Streptococcus infection.
Viability. Effect of ultra-violet rays on streptococci, **64**.
STREPTOCOCCUS INFECTION.
General. Streptococcal abortion in mares, **319**; tonsillitis in dogs due to haemolytic streptococci, **312**; streptococcal infection in pigs, **508**.
See also Mastitis, bovine.
Diagnosis. Skin test for detecting group C haemolytic streptococcal infection causing epizootic lymphadenitis in g. pigs, **542**.
Immunity. Bacterial allergy and experimental infection of the lungs with streptococci, **127**; immunizing activity of certain chemical fractions isolated from haemolytic streptococci, **616**.
See also Streptococcus, haemolysis.
Treatment. Action of prontosil in experimental infection, **637**; chemotherapy of streptococcic infections with the derivatives of p-amino-phenyl sulphamide, **299**.
STR. EQUI INFECTION [STRANGLES]. *Str. equi* and related strains, **507**; cause and therapy of malignant strangles, **507**.
STR. EQUINUS. See Streptococcus, general.
STR. LACTIS. See Streptococcus, general.
STR. PYOGENES. See Streptococcus, general.
STRIGEIDAE. See *Alaria*.
STRIKE, BLOWFLY. See Blowflies.
STRONGYLES. Fauna of British India, including Ceylon and Burma, Strongyloidea, **183**; toxicity of urine and some related substances for sclerostome larvae in faeces, **539**.
See also *Amidostomum*; *Angiostrongylus*; *Bunostomum*; *Chabertia*; *Cooperia*; *Crenosoma*; *Haemonchus*; Lungworms; *Metastrongylus*; Nematodes; *Oesophagostomum*; *Oslerus*; *Stephanurus*; *Strongylus*; *Trichostrongylus*.
STRONGYLOIDES. Strongyloides of domestic animals, **474**.
STRONGYLUS. Verminous bronchitis of swine caused by *Strongylus paradoxus*, **612**.
STUTTGART DISEASE. See Leptospira infection.
SUBLIMATE TEST. In blood diseases, **394**.
SUBMAXILLARY GLAND. See Salivary gland virus.
SUDAN. See also *M. tuberculosis* infection, in cattle; Reports, Sudan.
SUDAN GRASS. See Poisoning, plant poisoning.
SULFOCYANATE. Treatment of mange in g. pigs, **36**.
SULPHANILAMIDE. See P-amino-phenyl sulphamide.
SULPHUR. Inhibiting effect of sulphur in selenized soil on toxicity of wheat to rats, **250**.
See also Avitaminosis; *M. tuberculosis*, viability; *Oesophagostomum*.
SURFEN C. Treatment of equine *Trypanosoma congolense* infections with surfen C (Bayer), **440**.
SURRA. See *Trypanosoma evansi* infection.
"SWAYBACK". A congenital demyelinating disease of lambs with affinities to Schilder's encephalitis, **131**.
SWEAT GLANDS. See also Skin, general.
SWEDEN. See Colleges; Reports, Sweden.
SWINE.
General. See Actinomycosis; Milk, bacterial content; Piglets.
Arthropod parasites. See Lice; Parasitic infestation, general.
Bacterial diseases. The pig as carrier of *Pfeifferella whitmori*, **208**.
See also *Bacillus anthracis* infection; Brucella infection; *Erysipelothrix rhusiopathiae* infection; *M. tuberculosis* infection; Pasteurella infection, in swine [swine plague]; Salmonella infection, in swine; *Streptococcus* infection.
Diseases, general, 434, **543**; in the U.S.A., **621**; in Germany, **290**; work on diseases in 1935, **81**; post-mortem diagnosis of diseases, **434**; wastage in the pig industry, **82**.
See also Broncho-pneumonia; Cysts, general; Digestive system, diseases; Encephalitis; Goitre; Nutritional diseases; Rhinitis; Skin, diseases Teratology; Trembling disease.
Genital system. See Pregnyl; Prolan.
Helminth parasites. See Helminth parasites, swine parasites.
Physiology. See Blood, coagulation; Eyes, general; Lymphatic system; Magnesium; Scrotum; Testis.
Poisoning. See Poisoning, inorganic.
Protozoan diseases. Sarcosporidial cysts in the muscles of swine, **68**.
See also Rickettsia infection.

SWINE [cont'd.]
Virus diseases. See Encephalitis; Exanthema, vesicular of swine. Influenza, general, swine; Nervous system, pathological changes; Pox, in swine; Skin, diseases; Swine fever; Swineherd's disease.
SWINE ERYSIPELAS. See *Erysipelothrix rhusiopathiae* infection, in swine.
SWINE FEVER.
General. In Germany, **70**; in South Africa, **227**, **603**; in Brazil, **471**; transmissible to sheep and goats, **277**; resistance of the Berkjala breed, **603**.
See also *Corynebacterium pyogenes* infection.
Control. In Czechoslovakia, **17**; use of infected meat, **70**.
Diagnosis. In France and North Africa, **277**; by Sarnowiec's test and the precipitation test, **227**; an intradermal test, **615**; from decomposed carcasses, **423**; sero-diagnosis, **277**; local eosinophilia in histological diagnosis, **178**.
Immunization, **277**; in Yugoslavia, **114**; with a saponinized vaccine, **71**; simultaneous inoculation of sucking pigs, **423**; influence of diet and management, **277**.
Pathological changes. Blood picture in experimental infection, **71**; variations in protein fractions of serum during hyperimmunization, **227**; composition of swine-fever-virus blood after preservation, **276**.
SWINE INFLUENZA. See Influenza, swine.
SWINE PLAGUE. See Pasteurella infection, in swine.
SWINE POX. See Pox, in swine.
SWINEHERD'S DISEASE, **219**, **528**.
SWITZERLAND. See Brucella infection, control; Reports, Switzerland.
SYRIA. See *Echinococcus*; Reports, Syria; Trypanosoma infection.

T

TABANIDAE. Horseflies of Arkansas, **537**.
See also *Haematopota*.
TAENIA. *T. saginata*, its growth and propagation, **610**; egg production in *T.s.*, **611**; ridding pasture of *T.s.* ova by grazing cattle or sheep, **335**; *T.s.* infestation in man in Victoria, Australia, **123**; the scolex of *T. echinococcus*, **430**; research on *T.e.*, **283**.
See also *Cysticercus*.
TAENIIDEA. See *Cysticercus*; *Echinococcus*; Fimbriariinae; *Hymenolepis*; *Moniezia*; *Raillietina*; *Taenia*.
TANGANYIKA TERRITORY. See Blood, chemical composition; Brucella infection, general; Glossina; Growth factors; Reports, Tanganyika.
TAPEWORMS. See Cestodes.
TEART PASTURES. See Diarrhoea.
TECHNIQUE. Manometric measurements of cultures, **401**; theory and practice of assaying antigens, **432**; method of plotting logarithmic growth-curves of protozoal cultures, **274**; dark field illumination in the diagnosis of tuberculosis and malaria, **39**; new bottles for blood culture work, **494**; method for obtaining bovine arterial blood, **494**; method of staining and mounting nematode larvae, **647**; preservation of pathological museum specimens under tropical conditions, **254**; electrocardiograph and its clinical application in the horse, **648**; care in drenching sheep, **639**.
See also Agglutination tests; Apparatus; Bacteria general, technique; Biological products, preservation of; Books; Cerebrospinal fluid; Filtration; Freezing; Microscopy; Pressure, atmospheric; Staining; Zootechny.
TEETH. Constructive and destructive processes in the teeth of normal and scorbutic organisms, **192**; periodontal disease in the horse, **659**; influence of diet on caries in children's teeth, **243**.
See also Brucella infection, in man; Vitamins, vitamin D.
TELLURIUM. See Poisoning.
TEMPERATURE. Investigation of blood and temperature in laboratory animals infected with *Brucella*, **212**.
See also Anaemia, equine infectious, diagnosis; Byres; *Clostridium botulinum*.
TERATOLOGY. Bovine double twin monsters, **629**; congenital lung anomalies, **395**; organ dystopia with special reference to ectopia cordis and diaphragmatic hernia, **630**; monstrosities produced by the injection of selenium salts into hens' eggs, **137**.
See also Diseases inherited; Endometriosis; Twins.
TERATOMA. See Twins.
TESTIS. Development of the testes and scrotum of the ram, bull and boar, **141**.
TESTS. See Agglutination; Biological test; Complement-fixation; Cuboni's pregnancy test; Flocculation; Formol-gelification test; Pregnancy, diagnosis; Schern-Gorli ring test; Serological tests; Sublimate test.
TETANUS. See *Clostridium tetani* infection.
TETANY. Grass tetany and milk fever, **241**; magnesium content of cows in lactation tetany districts, **241**; magnesium metabolism in, **398**.
TETRAMERES. *T. crami* in ducks in Canada, **542**.
TEXAS FEVER. See Babesia infection.
THALLIUM. See Poisoning, inorganic.
THEILERIA INFECTION. In Uganda, **498**; in Morocco, **522**; of cattle in India, **592**; changes in the virulence of *Th. annulata*, **417**; treatment of *Th. annulata* in cattle, with todorit, **247**; life cycle of *Th. dispar* in cattle and ticks, **167**; "kouba" strain of *Th. dispar* of Algeria, importance in immunization against theileriasis, **167**; control of East Coast fever in Africa with some remarks on Colonial Office policy, **467**; turning sickness, a protozoan encephalitis of cattle in Uganda, relationship with East Coast fever, **169**; relationship between the Palestinian and Algerian pathogenic theileria, **167**; comparison of bovine theileriasis in North Africa and Palestine, **590**.
THERAPEUTICS. Practical veterinary pharmacology, materia medica and therapeutics, **505**; Merck's yearbook of new work on pharmacology and therapeutics, **635**; relations between chemotherapeutic action and the oxidation reduction potential, **637**; dependence of the therapeutic results of serum treatment upon the intactness of the reticulo-endothelial system, **78**; non-specific protein therapy, **443**; mode of action in chemotherapy of protozoan infections, **635**.
See also Anthelmintics; Antiseptics; Antisera; Blood; Committees; Disinfectants; Helminth parasites and under name of helminth; Hormones; Insulin; Parasiticides; Parasitic infestation, general; Poisoning, and under names of specific diseases.
THYMUS. Thymus and adrenals in the response of the organism to injuries and intoxications, **399**; normal morphology, **444**.
THYROID GLAND. See Fowls, physiology; Goitre; Iodine.
TICK-BORNE FEVER. Transmission and distribution in sheep, **527**.
TICK PARALYSIS. In man and animals, **536**; in Yugoslavia, **334**, **535**; in sheep caused by *Ornithodorus lahorensis*, **229**.
See also Ticks.
TICKS. Report of Committee on Tick Eradication, U.S.A. Livestock Sanit. Ass., **536**; Ixodidae in the Ukraine, **121**; distribution and habits of *Rhipicephalus rossicus* in the Ukraine, **181**; in Southern Rhodesia, **536**; Ixodidae of Formosa, **607**; bacterial infection following tick infestation in lambs, **622**; viability of *Argas persicus* when fasting, **381**; development of *Babesia bigemina* in *Boophilus microplus*, **418**; *Ixodes ricinus* in a red deer, **230**; *I. ricinus* in relation to its physical environment, **181**; western dog tick *Dermacentor occidentalis* a vector of bovine piroplasmosis in California, **170**; biology of *Dermacentor silvarum*, **181**; mortality of sheep following bites of *Ornithodorus lahorensis*, **181**; *O. lahorensis* as a carrier of *Anaplasma ovis* and *Theileria recondita*, **181**; test with derris extract against ticks, **300**.
See also Anaplasma infection; Babesia infection, equine; Reports, Southern Rhodesia; Rickettsia; Theileria infection; Trypanosoma infection.
TISSUE CULTURE. See Immunity; Viruses, cultivation.
TISSUES, PERMEABILITY. See Permeability of tissues.
TISSUE RESPIRATION. Influence of infection, **64**, **394**.
TOCOTREMA LINGUA. In a silver fox, **538**.
TODORIT. See Theileria infection, treatment.
TONSILLITIS. See Streptococcus infection, general.
TONSILS. In mammals, **444**.
TOXICOLOGY. See Poisoning.
TOXINS. See Bacteria general, toxins; Clostridium infection, toxins; *Staphylococcus*, toxins.
TOXOPLASMA. In North American birds and attempted transmission to canaries and chickens, **524**.
TREMATODES. Sheep liver fluke, **281**.
See also *Alaria*; *Apophallus*; *Clinostomum*; *Clonorchis*; *Echinoparyphium*; *Fasciola*; *Harmostomum*; *Metorchis*; *Opisthorchis*; *Paragonimus*; *Prosthogonimus*; *Pseudamphistomum*; *Tocotrema*; Schistosoma infection, general.
TREMBLING DISEASE. In pigs, **546**; peculiar disease of calves, **348**.
TRICHINELLA. Trichinosis of swine in Yugoslavia, **386**; oral infection of pigeons, **232**; experimental infestation in dogs and cats, **232**; laboratory diagnosis, **125**; inspection of meat for trichinella in Poland, **439**; prenatal transmission from dam to foetus, **125**; iodine-silver impregnation of muscle trichinae, **232**; viability of unencapsulated trichinella at low temperatures, **339**.
TRICHINELLIDAE. See *Capillaria*; *Eucoleus*; *Trichuris*; *Trichinella*.
TRICHOCEPHALUS. See *Trichuris*.
TRICHODECTES. See Lice.
TRICHOMONAS. Cultural behaviour of *Trichomonas foetus*, **464**; comparison of *T. foetus* and *T. ruminatium*, **325**; resistance of bovine trichomonads to physical and chemical influences, **464**.

TRICHOMONAS INFECTION.
Avian. In pigeons, **14**.
Bovine, 463, 464 ; in Austria, **464** ; in Czechoslovakia, **325** ; in Denmark and Norway, **589** ; abortion in Hungary, **464** ; abortion in Germany, **325, 464** ; control, **29**.
TRICHOPHYTON. See Ringworm.
TRICHOSTRONGYLUS. Medicinal treatment of trichostrongylosis, **441**.
TRICHURIS. *Trichocephalus* in sheep in the U.S.S.R., **387** ; treatment of whipworms in the dog by intracecal injection, **550**.
TRIFOLIUM. See Poisoning, plant poisoning.
TRINIDAD. Rabies in the vampire bat of Trinidad, **528** ; report of a Dutch veterinary surgeon from Dutch Guiana on animal diseases and cattle breeding in Trinidad, **308**.
See also Helminth parasites, deer parasites ; Reports, Trinidad and Tobago.
TROGLOTREMATIDAE. See *Paragonimus*.
TRYPAFLAVINE. Curative value in haemorrhagic septicaemia, **36**.
TRYPANOSOMA.
General. Biology of the trypanosomes of man in Africa, **271** ; new trypanosome of horses in Syria, **163** ; effect of *T. gambiense* and *T. rhodesiense* of prolonged maintenance in mammals other than man with reference to the power of these to infect man, **215** ; development in glossina, **416** ; polymorphism of certain African trypanosomes in regard to their pathology, **463** ; cyclical transmissibility of *Tryp. brucei* and *Tryp. congolense* kept for a long time, **585** ; filtrability, **375** ; trypanolysis *in vitro* by mouse immune serum, **274** ; influence of drugs on metabolism of trypanosomes, **246**.
Cultivation. Attempts to cultivate *Tryp. lewisi* in the latex of euphorbia, **274** ; morphological variations of *Tryp. rabinowitchi* on solid media, **274**.
Drug Fastness. Studies of a strain of *Tryp. annamense* resistant to "tryparsamide", **218** ; attempt to obtain an atoxyl-resistant strain by means of a non-trypanocidal aromatic product, **246** ; rapid drug fastness obtained after cutting off the reticulo-endothelium, **636** ; arsenic-fastness, **442**.
Virulence. Influence of repeated transmissions in animals on the virulence of *T. rhodesiense* and *T. brucei*, **215** ; pathogenic action of *Tryp. lewisi*, **417**.
TRYPANOSOMA INFECTION.
General, 13, 586 ; in Rhodesia, **374** ; research in Southern Rhodesia, **271** ; *Tryp. vivax* infections in Mauritius, **522** ; effect of the plane of nutrition on the course of *Tryp. congolense* of cattle and sheep and *Tryp. brucei* infection of sheep, **586** ; experimental infection of fowls with trypanosomes pathogenic for mammals, **215** ; provision of clean animals for experimental trypanosomiasis, **271**.
In cattle. Incidence in Central India, **163** ; nitrogen and mineral metabolism during a chronic case of *Tryp. congolense* disease in an ox, **586**.
See also Trypanosoma infection, general ; *Tryp. evansi* infection [surra].
Control. In Northern Rhodesia, **215**.
Diagnosis. Formol-gelification tests of various animal sera, **186**.
See also *Tryp. equiperdum* infection [dourine].
Immunity, 215 ; immunity following cure of experimental *Tryp. brucei* infection by a chemotherapeutic agent, **375**.
Immunization, 375, 586, 587, 588.
In sheep. Nitrogen and mineral metabolism during acute infections of sheep with *Tryp. brucei*, **586**.
See also Trypanosoma infection, general.
In swine. *Tryp. simiae* infection, **273, 588** ; in the Gold Coast, **273**.
Transmission. Attempt to transmit *Tryp. gambiense* by *Glossina palpalis*, **215** ; high rate of infection in the salivary glands of *Glossina morsitans* after feeding on a reedbuck infected with *Tryp. rhodesiense*, **215** ; congenital infection with *Tryp. gambiense*, **585** ; transmission of *Tryp. brucei* by maternal milk, **585**.
Treatment, 13 ; chemotherapy of camel, equine and bovine trypanosomiasis, **96** ; chemotherapy of mixed infections, **636** ; resistance to aromatic arsenical and non-arsenical products, **246** ; chemotherapy of equine infections in Syria, **440** ; drug action on *Tryp. brucei*, **635** ; trials with pyrrole dyes, **636** ; arsenobenzol in experimental infections, **246** ; treatment of equine *Tryp. congolense* infections with surfen C (Bayer), **440** ; camel infections control by "naganol", **65**.
In wild animals. Antelopes as reservoirs of *Tryp. gambiense*, **215** ; susceptibility of shrew mice and antelopes, **14** ; natural infection of *Tryp. hippicum* in the vampire bat, **65** ; experimental trypanosomiasis of monkeys *Cynocephalus* by intraspinal inoculation, **215**.
TRYP. ANNAMENSE. See *Tryp. evansi*.
TRYP. BRUCEI. See Trypanosoma, general, cultivation, virulence ; Trypanosoma infection, in cattle, in sheep, immunization, transmission.
TRYP. CONGOLENSE. See Trypanosoma, general ; Trypanosoma infection, general, in cattle, treatment.
TRYPANOSOMA CRUZI INFECTION [CHAGAS' DISEASE]. Effects of arsenicals on *Tryp. cruzi* in tissue culture, **635** ; complement fixation test for Chagas' disease employing an artificial culture antigen, **324**.
TRYP. EQUIPERDUM INFECTION [DOURINE]. Serodiagnosis, **478** ; thermoprecipitation reaction, **163** ; chemotherapy and serological control, **163** ; various trypanosome extracts as antigens for the complement-fixation test, **324** ; reticulocyte count during experimental infection in the rabbit, **163**.
TRYP. EVANSI INFECTION [SURRA]. Variability in size of the trypanosomes and density of infection, natural and acquired immunity, **375** ; antigenic composition of *Tryp. evansi*, **271** ; prevention and treatment, **272** ; bovine trypanosomiasis in India, **272** ; curative treatment in bovines, **272** ; blood chemistry in rabbits infected with *Tryp. annamense*, **218** ; treatment of *Tryp. annamense* infection in cats, rabbits and g. pigs, **218** ; Kurloff bodies in *Tryp. annamense* infection in the g. pig, **273** ; cutaneous localization of *Tryp. marocanum* in the g. pig, **273**.
See also Trypanosoma infection, general.
TRYP. GAMBIENSE. See Trypanosoma ; Trypanosoma infection, transmission, in wild animals and birds.
TRYP. HIPPICUM. See Trypanosoma infection, in wild animals and birds.
TRYP. LEWISI. See Trypanosoma, cultivation ; Trypanosoma infection, general.
TRYP. MAROCANUM. See *Tryp. evansi*.
TRYP. RABINOWITCHI. See Trypanosoma group, cultivation.
TRYP. RHODESIENSE. See Trypanosoma, virulence.
TRYP. SIMIAE. See Trypanosoma infection, in swine.
TRYP. VIVAX. See Trypanosoma infection, general.
TRYPSIN. Effect on *Cl. welchii* toxins, **160**.
TSETSE FLIES. See Glossina.
TUBERCULIN. See *M. tuberculosis*, tuberculin.
TUMOURS. See Neoplasms.
TUNIS. See Reports, Tunis.
TURKEY. Veterinary medicine in Turkey, **450**.
See also Law, Turkey ; Services, veterinary.
TURKEYS. See Helminth parasites, turkey parasites ; *Histomonas meleagridis* infection [blackhead] ; Salmonella infection [paratyphoid], in turkeys.
TURNING SICKNESS. Protozoan encephalitis of cattle in Uganda, relationship with East Coast fever, **169**.
TWINS. Rudimentary twin formations, **349**.
TYMPANY. See Digestive system.
TYPHUS. Mechanism of immunity, **478**.

U

UDDER. See Brucella infection, in milk ; Clostridium infection, in sheep ; Lactation ; Mammary gland ; *M. tuberculosis* infection, in milk ; Staphylococci.
UGANDA. See Bluetongue ; Encephalitis ; *M. tuberculosis*, infection ; Rabies ; Reports, Uganda ; Theileria infection ; Trypanosoma infection.
ULTRAFILTRATION. See Filtration.
ULTRA-VIOLET RAYS. Influence of solar ultraviolet radiation upon the blood chemistry and mineral metabolism of calves, **252** ; effect of ultra-violet rays on *Erysipelothrix rhusiopathiae*, *Salmonella cholerae-suis* and streptococci, **64**.
UNDULANT FEVER. See Brucella infection, in man [undulant fever].
UNION OF SOCIALIST SOVIET REPUBLICS. Work done in 1935 and development of veterinary activities in 1936, **308** ; army veterinary service, **90** ; veterinary programme for 1935, **91** ; impressions of medicine, **90**.
See also Babesia infection ; Brucella infection, in man ; Breeding ; *Diphyllobothrium* ; Eimeria infection, avian, porcine ; Encephalitis ; Encephalomyelitis ; Helminth parasites, sheep parasites ; Leishmania infection ; *Pfeifferella mallei* infection Protozoa general ; Spirochaeta infection ; Ticks.
UNION OF SOUTH AFRICA. Cooperation between the Division of Veterinary Services and the farmer, **304**.
See also Blowflies ; Brucella infection, in man ; Clostridium infection, in sheep ; Foot and mouth disease ; Rabies ; Reports, Union of South Africa ; Swine fever.

UNITED STATES OF AMERICA. Government research on diseases of fur animals, **483** ; milk control in the U.S.A., **489**.
See also *Amidostomum* ; Anaemia, equine infectious ; Anaplasma infection, bovine ; Brucella group, differentiation ; Brucella infection, general, in cattle, control, in man ; Clostridium infection ; Committees ; Entamoeba infection ; Fowls, diseases general ; Influenza, in swine ; Lambs ; Law ; Mastitis, bovine, control ; *Metorchis* ; Milk hygiene ; *M. tuberculosis* infection, control ; in swine ; Parasitic infestation, general ; Pasteurella infection, in cattle ; Protozoa, general ; Public health ; Rabies ; Reports ; Reviews ; Rhinitis ; Services, veterinary ; Skeletal disease ; Swine, diseases general ; Ticks.
URECHITES SUBERECTA. See Poisoning, plant poisoning.
URINE. See *Brucella abortus* infection, diagnosis ; Haematuria ; Haemoglobinuria ; Kidneys ; Pregnancy, diagnosis.
UROPYGIAL GLAND. Relation between the uropygial gland and vitamin D deficiency in chicks, **135**.
UTERUS. Uterine contractions in cattle caused by lentin, **37** ; action of lentin and pituitary extract on the mare's uterus, **639, 552** ; action of posterior pituitary extracts, **638**.
See also Brucella infection, immunization ; Endometriosis ; Vaccinia.

V

VACCINES. Protective power of heat killed virulent and living avirulent plague vaccines, **616**.
See also Antigens ; Immunity ; Immunization ; Reports, Eritrea ; Reticulo-endothelial system ; Viruses, cultivation, and under names of specific diseases.
VACCINIA. Affinity of vaccinia for the epithelial elements of Shope's papilloma, **180** ; ; immunizing power of vaccinia lymph from animals affected with rinderpest, **422** ; photodynamic effect of various dyes on vaccine virus, **533** ; intra-uterine vaccinia in pregnant animals, **534**.
See also Pox ; Viruses.
VAGINIA. Vaginal acidity of mares, **142** ; vaginitis in cows in Ruanda, Belgian Congo, **29**.
See also Endometriosis.
VANADIUM. See Poisoning.
VARIOLA. See Pox.
VENEZUELA. Report of a veterinary surgeon from Dutch Guiana on animal diseases and cattle breeding in Venezuela, **308**.
VENOMS. The invasion of the body by animal poisons, **358** ; effect of snake bites on animals, **302** ; adder bites in dogs and cattle, **302**.
VERMIN CONTROL. Pathological effect of poisons used for rodents, **355** ; prohibition of bacterial vermin killers in Germany, **352**.
See also Rabbits, general.
VERMINOUS BRONCHITIS. See Lungworms.
VESICULAR EXANTHEMA. See Exanthema, vesicular.
VESICULAR STOMATITIS. See Stomatitis, vesicular.
VETERINARY COLLEGES. See Colleges.
VETERINARY SCIENCE. History of the development of the veterinary profession in Germany, **404** ; history of veterinary affairs in the German colonies, **496** ; veterinary medicine in Turkey, **450** ; first steps for the veterinary practitioner, **506** ; veterinary programme for 1935 in Russia, **91**.
See also Services, veterinary.
VETERINARY SERVICES. See Services, veterinary.
VI ANTIGENS. See Antigens.
VIBRIO FOETUS. See Abortion.
VIBRION SEPTIQUE. See *Clostridium septique*.
VIRUSES.
General. Virus diseases, present position, **274** ; recent advances in the study of viruses and diseases, **525** ; viruses and Koch's postulates, **473** ; routes of infection and paths of transmission, **172** ; relation of pathogenic viruses to the cells of their hosts, **533** ; plant viruses and their relation to those affecting man and animals, **593** ; spontaneous virus diseases in laboratory animals, mice, rats, cats, and monkeys, **473** ; variation in animal viruses, **275** ; high speed vacuum centrifuge for the study of filterable viruses, **449**.
See also Bacteriophage ; Encephalitis ; Influenza, general ; Poliomyelitis ; Salivary gland virus ; Tick borne fever.
Bird viruses. Virus disease of owls, **472**.
See also Cell inclusion disease ; Fowl plague ; Fowl pox ; Laryngotracheitis, avian ; Leucosis, avian ; Psittacosis.
Cat viruses. A new virus disease of cats, **345**.
See also Gastro-enteritis.
Cattle Viruses. See Exanthema, vesicular ; Foot and mouth disease ; Pleuropneumonia, contagious bovine ; Rinderpest.
Cultivation. Value of tissue culture, **594** ; cultivation of pox and rabies virus on yeast culture media, **117** ; ; *in vitro* cultivation of the filtrable viruses with reference to vaccine, **227**.
See also Fowls, virus diseases ; Viruses, nature of.
Cultivation [egg embryo]. Use of the developing egg in virus research, **525, 526** ; influenza virus on developing egg, **378, 379** ; effect of louping ill virus, **377**.
Dog viruses. "Saprophytic" virus from the dog, **178**.
See also Distemper, dog ; Rabies.
Fox viruses. See Encephalitis.
Horse viruses. Equine abortion caused by a virus, **319**.
See also Anaemia, equine infectious ; Encephalomyelitis ; Horse-sickness, African.
Immunization. Inactivating effect of artificial subcutaneous infiltration on dog distemper, foot and mouth disease and fowl plague virus—a new method of immunization, **427**.
See also Immunity, viruses.
Nature of, 172, 594 ; nature of ultra-microscopic viruses and their cultivation, **172** ; nature of a virus isolated from the central nervous system of goats affected with an infectious pleuropneumonia, **331** ; ultrafiltration and probable dimensions of the viruses of foot and mouth disease and vesicular stomatitis, **470**.
Neurotropic. Acquired resistance of growing animals to certain neurotropic viruses in the absence of humoral antibodies or previous exposure to infection, **377**.
See also Aujeszky's disease ; Encephalitis ; Encephalomyelitis ; Louping ill ; Rabies ; Rift Valley fever.
Pneumotropic. Pneumotropic virus diseases in man and animals, **526**.
See also Bronchitis, infectious equine ; Coryza ; Influenza ; Laryngotracheitis ; Pleuro-pneumonia.
Rabbit virus. See Myxomatosis ; Papilloma ; Pox, in rabbits.
Staining. With victoria blue, **253**.
Swine viruses. See Influenza, swine ; Pox, in swine ; Swine fever ; Swineherd's disease.
Viability. Preservation in the frozen state, **427** ; photodynamic effect of various dyes on vaccine virus, **533** ; effects of ultra-high atmospheric pressure, **583**.
See also Rabies, viability.
VITAMINS.
General. Vitamins in theory and practice, **564** ; influence on immunity in animals, **620** ; vitamins and hormones, **152** ; healing of fractures, influence of vitamins, **31**.
See also Avitaminosis ; Nutritional diseases.
Vitamin A. Carotene content of some South African feeds, **142**.
Vitamin B. Vitamin B-deficiency and resistance to the toxin of Cl. *welchii* in rats, **160**.
Vitamin B_1. Biochemical lesion in Vitamin B_1 deficiency, **135**.
Vitamin C. Vitamin C ascorbic acid, **39** ; constructive and destructive processes in the bones and teeth of normal and scorbutic organisms, **192**.
Vitamin D. Antirachitic effectiveness of vitamin D from various sources, **85** ; vitamin D and the teeth, **243** ; vitamin D sparing action of magnesium in the ration of dairy cattle, **252** ; corn silage as a source of vitamin D for dairy cattle, **253** ; relation between the uropygial gland and vitamin D deficiency in chicks, **135** ; vitamin D in experimental tuberculosis of g. pigs, **569**.
See also Rickets.
Vitamin E. Deficiency in rats, **33** ; clinical experience with wheat germ oil, **33**.
VULVA. Infectious papilloma of the vulva of the cow, **397**.

W

WARBLE FLIES. See Oestridae, warbles.
WARFARE. See Gases, poisonous.
WATER. See Brucella group, viability ; Brucella infection, diagnosis [agglutination test].
WATER BLOOM. See Poisoning, plant poisoning.
WEIDNERIT-GEL. See Milker's ointments.
WHEAT GERM OIL. See Vitamins, vitamin E.
WHIPWORMS. See *Trichuris*.
WILD ANIMALS AND BIRDS. Helminth parasites of wild birds in the South Wales area, **608**.
See also Antelopes ; Bats ; Diseases general, unspecified ; Elk ; Foxes ; Trypanosoma infection, in wild animals, Venoms.
WOHLFAHRTIA. See Blowflies and flesh flies.
WOOL. See Fleece.
WOUNDS. Wound healing, **393**.

X

X-RAYS. See Entamoeba infection ; Fowl plague, virus ; Radiography.

Y

YEARBOOKS. American Public Health Association Year Book, 1935-1936, **451**.
See also Books ; Reports, Bulgaria.

YEAST. See Foot and mouth disease, virus ; Virus, cultivation.
YUGOSLAVIA. Animal husbandry and livestock diseases, **394**.
See also Anaemia, equine infectious ; *Bacillus anthracis* infection ; Brucella infection, immunity ; *Cysticercus* ; Foot and mouth disease ; Haematuria ; Helminth parasites, general, bird parasites ; Protozoa, general ; Rabies, general ; Respiratory system, diseases ; Sheep pox ; Swine fever, immunization ; Tick paralysis ; *Trichinella*.

Z

ZINC POISONING. See Poisoning.
ZOOLOGICAL GARDENS. Causes of death in animals in zoological gardens, **342**.
ZOOLOGY. The law of priority, **306**.
See also Books.
ZOOTECHNY. Practical animal husbandry, **152** ; relation of animal nutrition to public health in India, **648** ; wastage in pig industry, **82** ; animal husbandry in French Guiana, **90** ; care in drenching sheep, **639**.
See also Books, text books ; Byres ; Yugoslavia.
"ZYSTERNAL". See Mastitis, bovine, treatment.

ERRATA.

p. 25, von Vasarhelyi, J. (1935). for **"AO" Tuberculin** read, **"AO" Vaccine.**
p. 76, Rousseau, L. (1936). for **French Guinea,** read **French Guiana.**
p. 561, Great Britain. (1937). for **1 August 1906,** read **1 August 1936.**